NEWS LETTER

THE SCOTTISH SOCIETY

OF

ANAESTHETISTS

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SCOTTISH SOCIETY OF ANAESTHETISTS

Office Bearers 1978–79

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Glasgow	Dr. A.A. SPENCE	1980
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Editor of the Newsletter	Dr. D.F. STEEL, Division of Anaesthetics, Royal Alexandra Infirmary, Paisley, PA2 6LX.	

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Programme for 1979

REGISTRAR'S PRIZE: Entries to be submitted to the Secretary by the 28th February, 1979

ANNUAL GENERAL MEETING: Post House Aviemore, 27th/29th April, 1979

REGISTRARS' MEETING: Glasgow, June 1979

SCIENTIFIC MEETING: Edinburgh, November 1979

Registrar's Prize

The Society annually awards a prize of £60 for the best original paper submitted by an anaesthetist in Scotland, holding the grade of Senior Registar or under. A second prize of £30 or a third of £10 may be awarded for other papers of particular merit at the discretion of the assessors. It is not necessary that the Registrar be a member of the Society.

The conditions attaching to the award are as follows:–

1. The paper must be original, i.e., it should not have been read previously at any meeting or published in any journal. The winning of the prize is in no way a bar to the subsequent publication of the paper.

2. It is desirable that papers submitted show evidence of personal work, but papers consisting of surveys of the literature are eligible for consideration. The Council of the Society wishes to stress that intending competitiors should not be discouraged through fear of their efforts being judged elementary. It is fully realised that junior anaesthetists in some peripheral hospitals may not have opportunities to deal with special types of cases or to employ advanced anaesthetic techniques.

3. Papers for adjudication **must** reach the Secretary by the **end of February** at the latest.

4. The winner of the prize will be required to give a digest of the paper at the Annual General Meeting of the Society towards the end of April

The Secretary places all entries in the hands of the Award Committee which consists of the President, Vice-President and Past President. The members of this Committee have expressed the desire to be able to adjudicate without knowing the name or hospital of the writer; it is requested therefore that the name, address, etc., of the entrant be submitted on a separate covering page. This will be retained by the Secretary, but otherwise the essay itself should give no indication as to its source: acknowledgment to colleagues, etc., should not be included.

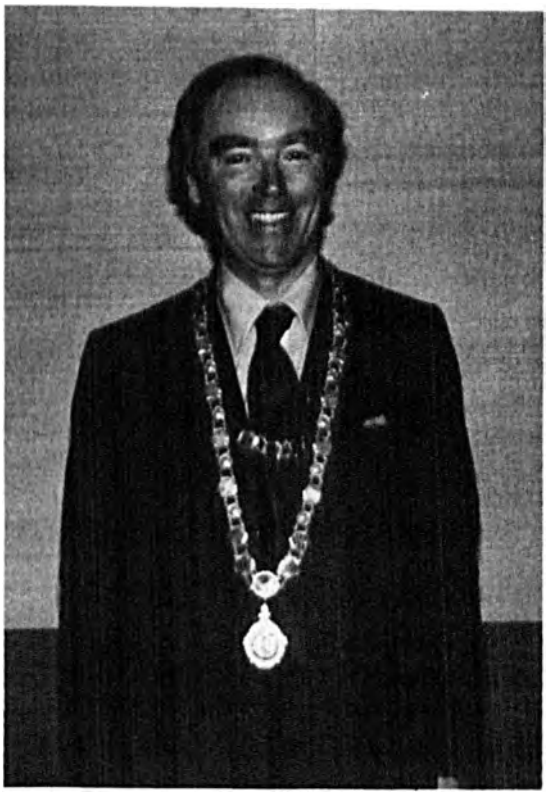
The prize for 1978 was won by Dr. Peter J. McKenzie of the Western Infirmary, Glasgow, for his paper entitled "Comparison of Spinal and General Anaesthesia for patients with Fractured Neck of Femur".

President's Newsletter

By the time this Newsletter appears, the inaugural Gillies Lecture will have been delivered by Professor Gordon Robson on the occasion of the Scientific Meeting of the Society. The lectureship has been generously endowed by the Gillies family in memory of their father and mother, the late Dr and Mrs John Gillies, and we hope that Deirdre and Ian Gillies will be present to hear the first lecture.

Your Society thought it fitting that the lecture which is to be delivered annually by an anaesthetist of distinction on a topic promoting safe clinical anaesthesia should conclude the proceedings of the Scientific Meeting. In consequence, the date and format of the Scientific Meeting have been changed – from an afternoon meeting in May to an all day meeting in November – a change which, we trust, will have the support of the Society.

To turn to more mundane matters, on several occasions in recent years, your President has had occasion to deplore the unfavourable position of anaesthetists so far as the allocation of Distinction Awards is concerned. There has in fact been a slight increase in the proportion of anaesthetists who hold such awards – from 18.8% in 1973 to 23.2% in 1977 but this is still almost bottom of the league. To make representations on your behalf, we sought and obtained an interview at St. Andrews House with Professor Sir John Crofton and Sir Robert Wright. At this meeting in September, Professor J.D. Robertson represented the Faculty of Anaesthetists, Professor Donald Campbell represented the Association of Anaesthetists and I as your President represented the Scottish Society of Anaesthetists. We were courteously received and had an opportunity to present the situation as we saw it. In a frank discussion, Sir John and Sir Robert showed that they were aware of the position and were not unsympathetic. Whether such sympathy will eventually be reflected in a real improvement in the percentage of awards, time will tell but it would be unrealistic to expect any dramatic change.



This Newsletter gives me the welcome opportunity to place on record the debt that I owe and that the Society owes to your office bearers and members of Council who have so assiduously attended Council meetings and brought their individual expertise to bear on the matters in hand. In particular, I must mention the indefatigable Dr Douglas Arthur who, as Secretary, has organised the affairs of Council and Society so efficiently over the past three and a half years. One of his particular problems has been the arrangement of a trip to Czechoslovakia which your Council has reluctantly had to cancel. Despite repeated letters and efforts to complete the arrangements, Dr Arthur has been unable to obtain a reply from our Czech colleagues and we have decided to explore instead the possibility of visiting Yugoslavia though the earliest that this could be arranged would be 1980.

Annual General Meeting – Aviemore

28th – 30th April, 1978

That familiarity breeds contempt might not be at all obvious from the turn out of members and guests at the Society's seventh visit to the Post House Aviemore. The continuing enthusiastic support for this meeting among many members who have returned frequently must in large part be due to the excellent service we are shown by the hotel staff, and the increasing number of new faces must show a welcome encouragement from those who have been before, long may this healthy state of affairs continue.

The academic side of the meeting was again attended by a capacity crowd without the associated incidents which usually attend large gatherings on Saturday afternoons! Reports of the papers appear later in the journal. However, there was the usual controlled hooliganism to music which might pass for the dance in the evening following an excellent dinner attended by over 160 members, guests, and colleagues from the trade exhibition.

Sporting activities were largely restricted to Friday afternoon on Boat of Garten golf course for all who wished and Lochindorb for those who wished to fish! The ladies again took to the ice on Saturday morning during the A.G.M. for some curling of the non tonsorial variety! The prizes for all were donated by our kind supporters in the trade and were presented most graciously by Mrs. Masson.

We return again this year on 27th April, 1979 till 29th April, 1979 and your council extends a warm welcome to all members and we look forward to another successful meeting.

Presidential Address...

Dr. A.H.B. MASSON

ALTERNATIVE USES FOR ANAESTHETIC DRUGS

What have the following in common – Fly-killers and Political Assassination; the Dry-Cleaning Industry and Rape; Preserving Fish and Murder? You can easily guess the answer to these riddles for my talk is entitled 'Alternative Uses for Anaesthetic Drugs".

Anaesthetics have been used, or suggested, for removing biting insects, such as leeches, or those which cause Chaga's disease, or for killing flies, as the recent lively correspondence in "Anaesthesia" demonstrated; to subdue escaped wild animals, as a humane killer and for the treatment of cholera. Their use in the dry cleaning industry is well known, while the amount of trilene, ether and chloroform used for cleaning jobs about the operating theatre must account for a sizeable proportion of the total consumption of these drugs. Less well known is that ethylene can delay the flowering of carnations, and the Department of Marine Biology in Stirling uses benzocaine to prolong the survival time of certain very deep swimming fish which normally dash themselves to death after capture. These are but a sample of the rather esoteric uses to which anaesthetic drugs have been put, but I wish to talk about a different type of use – Anaesthesia for Crime.

My interest which, I hasten to add, is purely academic, extends back over many years and I have collected over 100 examples from the pages of journals ranging from the popular press to professional publications.

The first reported robbery ostensibly involving chloroform was in 1848, less than a year after its discovery though the incident would appear to have been a straightforward mugging by three men in the streets of London. Within the next two years, there were several other reports. The first conviction came in 1850 when two women, Margaret Higgins and Elizabeth Smith, described as "two women of depraved habits' received

sentences which were punitive on account of the public anxiety, not to say hysteria, about this new type of crime. They were supposed to have given chloroform to a solicitor and then robbed him of his watch, ring and personal clothing. The only evidence on the use of chloroform was the statement of a surgeon that he was perfectly satisfied it had been used because he had found the victim in a state of extreme nervous exhaustion which continued for three days. John Snow quite rightly condemned these reports as nothing more than ingenious inventions.

However, such was the popular fear that the Lord Chief Justice, Lord Campbell, introduced legislation to deal specifically with this type of crime. Clause 4 of the Offences against the Person Act of 1851 stated: It is expedient to make further provision for the punishment of persons using chloroform or other stupefying things in order the better to enable them to commit felonies. Snow then wrote a public letter to Lord Campbell stating that, in all the alleged cases, the evidence proved that chloroform could NOT have been the agent employed and he believed that the law already had sufficient powers to deal with any of these alleged crimes.

The Lord Chief Justice however did not believe him. Advocating the adoption of the Bill in the House of Lords, he acknowledged Snow's letter but argued, post hoc ergo propter hoc, that 'it stood indeed on record that since the discovery of chloroform, persons had been convicted before the competent courts of using that article for the purpose of robbery and he hoped their Lordships would be of opinion that those who made such an attempt should be held guilty of felony and be liable to be transported beyond the seas'.

Snow has, of coure, been proved right but, over the years, there have been numerous reports of chloroform robberies, some as unlikely as the ones on which Snow commented though one or two have a ring of probability. A book entitled "Taken for a Ride" or "A Distressing Account of the Misfortunes and Misadventure of the Early British Railway Traveller" contains a description of two robberies. In one of them, in 1855, two young shop assistants boarded a London train. Henry Perry had two bottles, one of which contained chloroform and the other a mixture of port and laudanum. The other man, Clarence Lewis, was carrying £100 in gold and cheques. Perry offered Lewis a drink, stating that it was a well known health tonic. It was, in fact, chloroform. He then offered the port and laudanum to get rid of the taste and followed this by putting some of his so-called "tonic" on a handkerchief and urged Lewis to sniff it. By this time Lewis was a bit groggy but was able to resist when Perry tried to steal his money. Perry than assaulted him and tried to throw him off the train. Perry was subsequently caught, convicted and sentenced to 30 lashes of the cat and 20 years penal servitude. There was also a salutory Victorian moral to this tale, for the victim, Lewis, was travelling in a first class carriage with a third class ticket.

The French railways were said to have a particularly bad reputation with 'chloroform gangs over-running them and drugging their victims before robbing them'. This was 100 years ago but the Sunday Times of December 21 1975 carried an article headed "Chloroform on the Orient Express" which went into some detail as to how "sleeping car gangs" – shades of the French railway gangs – were robbing passengers on the Orient Express. The thieves were alleged to open the compartment door and spray the inside with – and I quote – "a new high technology weapon, the chloroform aerosol can" before returning a few minutes later to rob the doped passenger. No wonder the Orient Express was withdrawn from service now that Hercule Poirot is no longer available to solve its mysteries.

While robbery is intrinsically unlikely to be assisted by anaesthetics, the same cannot be said of abduction or sexual assault, if I can take these together, when an unwilling victim, a degree of privacy and the need or wish to subdue resistance or quieten screams combine to suggest that this might be a more rewarding type of crime for the amateur anaesthetist. As early as 1848, the Lancet carried a tongue-in-cheek report that a sultan had ordered a cask of chloroform to replace the more traditional sack and string method of replenishing the harem. The first authentic report was in the Times of July 3 1854 and it read: Mr Carden, an Irish gentleman, assisted by an armed band of desperadoes, attacked a party of ladies returning from church and nearly succeeded in carrying off one of their number, a young lady of beauty and fortune. Indeed, as the judge said, "one minute's less resistance and Mr. Carden would certainly have succeeded. He would have borne his victim, surrounded by his myrmidons, miles from the scene and no man can say how the unfortunate lady would have fared in the hands of such men, flushed with victory, irritated with resistance and

desperate with the consciousness of exposure". But what has all this to do with chloroform? Well, it appeared that Carden had obtained two bottles of chloroform on the pretext that he needed it for a lady subject to hysterics. "This evidence", Carden's counsel said "should remove the shocking idea that his client had purchased chloroform in order to produce insensibility with the possible design of defiling the young lady". The judge, however, thought it "far more probable that, with such horrid apparatus, Mr. Carden had resolved to put the lady in such a position that she would consent to be his wife for fear of the consequences". Carden was sent to prison for two years which, said the Times, was far too lenient "for this was not the first occasion on which he had attempted to abduct the lady". A curious and improbable Victorian tale you may think and yet, in 1957, a man was charged at Dartford with using chloroform with intent to commit a criminal assualt. He is quoted as saying – "I love that girl and will do anything I can to get her to marry me".

A charge of rape may result from the use of anaesthetics when the drug has been used voluntarily for an examination or an operation or when it has been used criminally. So far as the first of these is concerned, almost all the reports have involved dentists rather than doctors. One of the very few to involve a doctor was in New Zealand in 1894 when a Dr. Moore was accused of criminally assaulting a woman while she was under the influence of chloroform for a minor operation. The accusation was made by the husband who at the same time demanded £250 for his silence. The crude blackmail attempt failed, however, and the husband was jailed for five years.

The first report involving a dentist was in 1857 when a Dr. Beale from Philadelphia was sentenced to 4½ years imprisonment after a trial in which the only evidence led was that the woman patient had complained of what were delicately described as "certain sensations" when she recovered from ether in the dental chair. Fortunately, poor Dr. Beale was subsequently pardoned, .the Appeal Court believing, not surprisingly, that "a great wrong may have been inflicted on an innocent man". In the following year, an even more curious and disturbing case was reported. A dentist in Montreal was indicted for rape. At the trial, the husband who, please note, had been present the whole time his wife was unconscious, testified that she was under the strongest impression that she had been violated while under the influence of chloroform. The incredible verdict of the jury was – guilty of an attempt to commit rape – with a recommendation to mercy!! Not all the allegations against dentists are unfounded. In the very recent past, detectives in America following up complaints about one particular dentist installed a hidden TV camera in his surgery. They then watched him sexually assualt a WPC while she was unconscious and posing as a patient.

The second group, that of criminal sexual assault where no operation is involved, has shown a trend which reflects 20th century morality – or immorality. In the post-war era, reports on such attacks on boys have been almost as frequent as on women while, within the last five years, the permissive society has shown itself in two cases, both of which involved doctors. An Italian neurologist admitted anaesthetising female patients and photographing them in indecent positions. In his defence he described this as "a new Freudian treatment for cases of slight nervous exhaustion". In 1972, Dr. Peter Drinkwater in an English court was sentenced to 12 years in prison. He had administered a large dose of rectal thiopentone and a lytic cocktail to his girlfriend who then died of suffocation after being put in what was described as a "bizarre position". Drinkwater did not recognise her plight since he was himself under the influence of alcohol and amphetamines at the time.

The most frequent reports of the misuse of anaesthetics involve accidental death or suicide. For suicide, all of the various agents, including thiopentone, have been used at one time or another. Drinking chloroform, fairly popular 100 years ago, has been replaced by halothane drinking. Several people have, in fact, survived after drinking a whole 250cc bottle of the stuff, though one man died after injectiong only a few ml.

Usually accidental deaths are a consequence of addiction. Addicts are a danger to themselves and a danger to others and it must be the duty of every anaesthetist to watch for possible addiction to any of the drugs we use, by any person who may have access to them – doctor, nurse or orderly. A tragic consequence of knowing about an addict and doing nothing about it was the case of Dr. Peter Gray who was found guilty of manslaughter in 1959. He anaesthetised a healthy infant for a hernia repair and failed to notice that the oxygen had run out because he was, at the time, under the influence of halothane. The sad fact is that his

colleagues had known for several years that he was an addict and had done nothing about having him removed to a safer job.

The ultimate crime is, of course, murder and though it is impossible even to guess at how many have been achieved by the use of anaesthetic agents or adjuncts it is probably more than one might suppose. If one were to include premedicating agents, some very famous cases would come to mind. Dr. Crippen used hyoscine. Dr. Bodkin Adams, who was in fact acquitted, was alleged to have used morphine.

In most cases up to 1960, the drug of choice was chloroform, and these include the most celebrated case of all, that of Adelaide Bartlett, but the pattern is changing as you will hear. The most unusual, though by no means the most interesting from the forensic point of view, was the case of Dr. Eugene Rowe who was convicted of murdering one of the patients he anaesthetised in a routine operating list. It was in the Hudson Clinic, New York in 1955, and the operation was a straightforward hernia. It transpired that Rowe was very tense and edgy before the operation started because the patient was a man he disliked intensely – on his own admission "a man I'd happily consign to hell". This was because Rowe was divorced and the patient had been the third party in the affair. The hospital used multi-dose bottles of a barbiturate, Surital, and, according to the theatre nurse, Rowe handed her a sealed bottle labelled Surital and instructed her to give the patient an injection before the operation began. When she gave it, the patient went into violent bronchospasm. Rowe took the syringe and gave a further injection which seemed to settle the patient but he died 70 minutes later in the recovery room. At autopsy that afternoon, the smell of ether was noted in the patient's lungs. The surital bottle was sent for analysis and as soon as the stopper was removed, it reeked of ether. Rowe said he had handed the bottle to the nurse unopened and claimed that no one could believe that he would murder a man in such an obvious way, knowing that, if anything went wrong, he would be the prime suspect. The jury did, however, believe it and convicted him of "unlawful murder by anaesthetic". I have not been able to find out what the anaesthetic was other than a barbiturate.

Another American anesthesiologist, 34 year old Dr. Carl Anthony Coppolino, achieved notoriety. On July 30, 1963, his friend and neighbour Colonel William Farber died, and Coppolino's wife, Dr. Carmella Coppolino, signed the death certificate to the effect that he had died of a heart attack. Two years and one mouth later she herself died, suddenly and unexpectedly, and her death was certified as being due to coronary occlusion. Less than a month after she died, Coppolino married again, this time a wealthy 39 year old divorcee, a Mrs. Mary Gibson.

That did it. Colonel Farber's widow went to the police and accused Coppolino of having murdered her husband. She claimed that she and Coppolino had been lovers and that, while under a hypnotic spell cast on her by Coppolino, she had refused to kill her husband but had stood by while he strangled him. The colonel's body was exhumed and PM showed a double fracture of the cricoid cartilage. Coppolino was arrested and tried for murder. The prosecution claimed that the fractures could have been caused only by homicidal violence and that there was no evidence of coronary disease. The defence, however, claimed that the fractures could have occurred after death and that Mrs. Farber's story could not be relied on since it was motivated by malice and a desire for revenge. Having heard the evidence, the jury voted for aquittal.

Coppolino, however, was not out of the wood, for there was still the little matter of his late wife. Immediately after this trial he was flown from New Jersey to Florida to be tried on a second murder charge – that he had murdered his wife. The forensic work upon which the charge was based was brilliant. After exhumation the medical examiner had gone over the whole skin surface with a magnifying glass and had found a minute needle puncture in one buttock. He then traced the track of the needle down to muscle tissue. Tests for all the standard poisons proved negative but an odd substance was found in both liver and brain – succinic acid which is a breakdown product of succinylmonocholine. Samples of the tissue in the buttock were found to contain succinyl monocholine and it was in higher concentration round the needle track than in the area further away. Moreover, there was none in the tissue of the opposite buttock. This was the evidence which convicted him of the murder of his wife by the injection of succinylcholine – a nasty way to die and one which I am sure he thought could never be proved. It is, I believe, unique in medico-legal history in that it is the first time that anyone has been convicted of using a poison when

no trace of that poison was actually found. Its breakdown products were enough. It is also the first murder using succinyl choline though not the last.

In August 1975, there was considerable disquiet at the Ann Arbor V.A. Hospital in Michegan. There seemed to have been an increase in the number of respiratory arrests occurring in the hospital. It was just a suspicion, however, possibly no more than a coincidence and the hot muggy weather and lack of air conditioning were thought to be two possible aetiological factors. The hospital board discussed the matter on August 4 without reaching any conclusions though a list was made of the incidents and the medications the patients had been getting. The only common factor they came up with was that all the patients were on IV fluids. Eleven days later three such incidents occurred within the space of 15 minutes in the ICU. They were seen after the respiratory arrest by an anesthesiologist who was impressed by the total flaccidity of the patients which suggested to him a muscle relaxant drug, a suspicion confirmed by the prompt reversal of the paralysis by atropine and prostigmine and by nerve stimulation studies. Urine samples confirmed the presence of pancuronium which had not been prescribed.

At this point, the FBI were called in. There was, of course, no certainty that all the respiratory arrests were connected or that they had a common cause, nor was there any indication as to who might be responsible or what the motive might be. As a first step, tight security precautions were put in force. Pancuronium was put under lock and key with the same restrictions on its use as for the narcotic analgesics, patients on IV fluids were segregated in special wards under tight guard and persons entering or leaving the hospital were liable to be searched. The epidemic stopped immediately.

An epidemiological survey was instituted and all recent deaths examined and put in one or other of three categories — high suspicion, moderate suspicion or no suspicion. The hospital had 430 beds and an 11 bed ICU and it was found that the average number of cardio-respiratory arrests was six per month but, that in July, this had jumped to 24 while in the first two weeks of August the number was 27. In all 51 suspicious episodes involving 35 patients were noted, some of the patients having as many as five arrests. Features common to the high suspicion group were a normal heart rhythm up to the time of the arrest, a high rate of successful resuscitation, IV fluids, being in the ICU. In addition, 70 per cent were noted to have been flaccid and all happened between 4 p.m. and midnight.

As a result of this survey, and the FBI investigations, suspicion fell on two Filipino nurses who were almost unique in having access to both the drugs and the patients and in having been in the vicinity at the time of the arrests. No motive has ever been suggested.

The nurses were put on trial, charged with murdering five patients and poisoning ten, and the case became something of a cause celebre. The trial lasted 13 weeks and the jury discussion went on for 93 hours over 15 days. They were found guilty but a defence fund was set up in the US and in Manilla which raised $100,000. Nursing groups rallied behind the nurses who claimed that they were the victims of a racially prejudiced jury. While this was going on, the prosecutor of Bergen County, New Jersey, reopened a ten year old investigation into suspicious hospital deaths there to see if there was any possible connection with the Ann Arbor incident. In 1966, over a period of almost a year, there had been 13 unexplained deaths in a small osteopathic hospital in his jurisdiction. Some were very peculiar. One was a four year old girl who had had an operation the previous evening. Next morning at 7.40 she was well and sleeping quietly. At 8 o'clock a technician came to take blood off and found her dead. No cause was found and her death certificate read "undetermined physiological reaction". Another was a 36 year old woman who had had a Caesarian section two days previously. She had a sudden unexplained respiratory arrest and died. Her death was certified as being due to "massive fat emboli from the liver" though at PM there was no fat in the lungs and no changes in the liver. A third was a woman of 26 who was perfectly well at 8 p.m., noted to be cyanosed at 9 and dead at 9.30. Her death was certified as acute hepatic necrosis though she was not even jaundiced.

Considerable suspicion attached to one of the surgeons at the hospital, particularly when his locker was searched and a number of ampoules of curare, mostly empty, were found though why he should bother to keep them is hard to understand. He claimed that he used the curare for experiments on dogs at the New Jersey medical

school, but no-one had ever seen him do any research work.

The case was reported to the public prosecutor but for reasons unknown, the investigation was dropped. It was believed that there was no possibility of obtaining judicial proof since, at that time, curare could not be detected in the tissues. At any rate, there was no exhumation, no pathologist was asked to re-evaluate the causes of death, the surgeon resigned from the hospital and there were no more mysterious deaths.

When the case was re-opened in 1975, the New York Times took it up with some enthusiasm and printed details of all the suspicious deaths. They forced the pace on the issue and publicly challenged the surgeon. One of the articles read – "Because the surgeon who still practises privately in New Jersey and is associated with two medical schools has not been charged with a crime, his name is being withheld by the Times. He did not respond to repeated requests by the Times for an interview and is referred to in the articles as Dr X". As a result of the massive publicity, six bodies were exhumed and a South American surgeon, a Dr Mario Jascalevich, was charged with "wilfully feloniously and with malice aforethought causing the deaths of patients in 1965 and 1966". His motive apparently was to discredit the other surgeons by causing the deaths of their patients while they were recovering from surgery.

Within the past few weeks there had been news of both of these cases. In the first, an appeal has been heard and a new trial granted, but U.S. attorney James Robertson decided that a guilty verdict was unlikely. The prosecution, he said, had failed to establish any motive or to explain why two nurses with no criminal or antisocial background should have conspired together. So they have been freed.

In the second, the trial has started of Dr Mario Jascalevich. The bodies of the victims were exhumed and although it was ten years since they died, lethal traces of curare were found. The good doctor is charged with five murders.

There are a number of instances where anaesthetics have had a less direct association with murder. In Denbigh Assizes for instance in 1938, a man was charged with murdering his brother-in-law by shooting. He claimed in his defence that the man had died, not as a result of the injury, but because of a prolonged period of anaesthesia due to the fact that the surgeon's stool slipped just as he had located the bullet and was about to remove it. This necessitated his changing his gown and gloves, causing a delay of about six minutes. When he returned to the operating table the position of the bullet had changed. The patient's breathing suddenly became shallow and stopped. The accused was found not guilty, death being considered to be due to chloroform poisoning.

It is a short step from murder to execution. A few months ago, the proposal was made that judicial execution in Texas and Oklahoma should take the form of the injection of a barbiturate and a muscle relaxant which the governor of Texas considered would provide "some dignity with death". Dr Wilson and I, in a letter to the Times, protested strongly about any suggestion that anaesthetists or any medical people should become state executioners or that asphyxial suffocation from muscle relaxants was in any way dignified. But it is strange how things repeat themselves. The Times of January 28, 1869 contained a report from New York that "a new thing in executions was tried. Chloroform was administered to the prisoner and, as soon as he was insensible, the drop fell. There was no evidence of pain and in twelve minutes the pulse had ceased to beat" – no doubt, a very dignified death, though at least the anaesthetist was not the executioner.

You can see now how things have changed from the prevalence of chloroform 100 years ago to the increasing use of muscle relaxants in recent years. Although in my next examples which concern relaxants the law was not broken, it is not inappropriate that they be mentioned in a talk of criminal uses of anaesthetic drugs.

In the 1960s, three extraordinary reports appeared on the use of succinylcholine for aversion therapy. One was from California and involved alcoholics. The second, from Kingston, Ontario, was also about alcoholics. The authors reported that they had produced apnoea "varying from 63 to 150 seconds with a mean of 90.4 and a standard deviation of 24 seconds". These investigators, who did not obtain informed consent from their patients, considered that this "most terrifying experience" might be "a therapeutically useful noxious stimulus". The third report in 1968 was in, of all journals, The Lancet. The authors treated 19 heroin addicts. An anaesthetist put a butterfly needle into a hand vein which was then screened from the patient so that he could not see when anything was being

injected. The patient was encouraged to give himself a fix but as soon as he did, scoline was injected into the butterfly needle. While the patient was paralysed and apnoeic, to use the words of the report "He was fed close to his ear forceful accounts of the dangers of the drug". (They did not say whether they meant scoline or heroin.) "This is how heroin can kill you. You may suffocate to death" the report then concluded "after minor cyanosis has developed, oxygen is administered". These techniques have been copied in more sinister areas. It is alleged that U.S. army physicians in Vietnam, the authorities in some South American countries and Soviet military interrogation teams (during one of the Arab–Israeli conflicts) all used scoline in a similar manner in order to extract information from unwilling captives, though as the Sunday Times observed – "In the nature of things, it is difficult to get corroborative evidence".

Finally, on a lighter note. In 1974 a solicitor's clerk at St Albans Court was jailed for six months. The judge said "It is difficult to imagine a more serious contempt of court and the consequences might have been grave if you had carried out your intention". And what was this heinous offence? He had been found on the roof of the court building beside the ventilation system with a small cylinder of laughing gas which he had intended to release into the ventilation system in order, he said "to interrupt the long-winded and boring court proceedings".

There are many other tales, but I have talked for long enough. The paradox of life is that the potentiality for evil exists in all things good. Anaesthesia, one of God's greatest gifts to suffering humanity, can be perverted and used for base ends. Edward Gibbon wrote in the "Decline and Fall of the Holy Roman Empire" that "History is little more than the register of the crimes, follies and misfortunes of Mankind". If this be so, then I have given you today a little of the History of Anaesthesia.

Guest Lecture

Dr. W.S. WREN

MORTALITY IN A CHILDREN'S HOSPITAL

This communication originated from a clinical impression which gained strength in the early 1970s' that, despite the concentration of intensive care facilities at Our Lady's Hospital for Sick Children, Dublin, 4 to 5 otherwise normal children died at the hospital from acquired respiratory disease each year.

The hospital is a 340 beded acute, general, children's teaching hospital. It provides a busy community service, and a referral service for children's diseases for a population of 3.1 million.

The validity of the clinical impression was assessed by studying the causes of death reported, in all post mortems performed at the hospital, over a ten year period.

As the study progressed it revealed, with clarity, the principle causes of death in the paediatric age group. Equally clearly, it showed that "common" conditions still cause death in childhood, and raised the implications of this information for the practice, and training of anaesthetists.

A total of 1321 post mortem reports were studied, and in many cases the clinical records of the patients also. The only exclusions from the study were patients known to have Cystic Fibrosis or Leukaemia, who succumbed after repeated admissions, and infants with Hyaline Membrane Disease.

Three main categories accounted for 57% the reports studied. They were, Congenital Heart Disease, "Surgical Lesions", and Respiratory Disease.

The total number of deaths attributed to Congenital Heart Disease, including both those who had had cardiac surgery and those who had not, was 308. A figure of this order was not unexpected, because the cardiological and cardiac surgical services for congenital heart disease for a population of 3.1 million are centered at the hospital.

The total number of deaths classified under the various "surgical lesions" was 245. To put this figure in true context it is necessary to realize that

it does not represent mortality in the operative period. Reports in this total are classified under the lesion which required surgery, and the year in which death occurred; thus, for example, a patient with atresia of oesophagus, operated upon as a newborn in 1970, who died of congenital heart disease in 1972, would, for the purpose of this study, be recorded as death from atresia of the oesophagus in 1972.

It is not unexpected that 180 of these 245 reports were classified under the major congenital defects which require primary surgery in the newborn period. While the results, in certain individual lesions, from time to time, may be a matter of concern within the hospital, the overall surgical results can withstand scrutiny, for two reasons;

(a) The mortality rate for surgical lesions has remained unchanged, over a period during which the number of operations performed (p.a.) has increased by 45%.

(b) The figures are directly comparable with those in the only other major similar study in paediatrics.

By co-incidence, as this study came towards completion, Dr. R.M. Smith of The Children's Medical Center, Boston, published a comparison of the results obtained with surgical lesions between a University General Hospital, and a University Paediatric Hospital. To ensure that any death that might in any way be associated with a surgical lesion is included, for statistical purposes, two further groups of patients have been added to the 245 surgical lesions mentioned above. These are deaths in patients who have had cardiac surgery, and deaths from any cause in patients admitted with Spina Bifida. The resulting total of deaths associated with surgical admissions would then be 382, and the comparison with the Boston figures, as follows:

	Total Operations	Total Deaths	Mortality% (overall)	Mortality% (under one year)
*University Paediatric Hospital.	54,737	849	1.55	4
Our Lady's Hospital for Sick Children	51,794	382	0.73	3.28

*from Smith R.M. Anesthesiology, August 1975.

It must be pointed out again that neither of these surveys refers to operative mortality, and that the discrepancy in overall mortality is, almost certainly, a direct reflection of the size of referral population to the two hospitals.

However, with startling contrast, the study also produced conclusive evidence, that there is a continuing mortality from the "common" classical conditions of childhood. It revealed six patients admitted with Pyloric Stenosis, who, despite completely uneventful pre-operative, intra-operative, and post-operative progress, while apparently completely well collapsed six to eight weeks post-operatively, and died of a wide range of conditions varying from *E.coli* Septicaemia to pneumocystis carinii pneumonia: five patients, admitted moribund, who, despite all efforts at resuscitation, succumbed to the effects of their acute appendicitis: and three patients with acute intussusception, two of whom were admitted moribund, the third developing severe endotoxin shock, from whose sequelae he succumbed five years later.

Further, on the basis of sequences of selected cases, it was possible to say that the infant and very young child were at particular risk around the operative period. Problems in assessment, management, and monitoring could more easily be associated with mortality in this age group, than in either of the other two paediatric groups, the newborn or the older child.

In 200, otherwise normal children, respiratory disease was given as the cause of death. However, as this total includes the debatable group of Sudden Infant Deaths ("cot deaths") of which there were 109 during the course of the study, it is more accurate to speak of a total of 91 deaths from respiratory disease during that period. These deaths averaged out at 9 per year, and study of their case notes revealed that each year 4 to 5 such

patients were admitted so ill as to survive admission by less than one hour. The study therefore supports the clinical impression, that despite deploying the full resources of modern intensive care, 4 to 5 children with no other ailments die from respiratory disease at the hospital each year.

This, brief outline of some of the evidence produced by this study, can be approached in two fundamentally different ways. It is possible to say that much of the evidence is not directly related to anaesthesia, and should not have been included; that the mortality attributable to anaesthesia stands at 4:100,000, and there is nothing in this survey to alter that ratio.

Alternatively, if the study is to be used with profit, the evidence which it provides must be related to the current, vigorous debate on the provision of adequate services for child care, in Ireland and the United Kingdom.

A great deal of this debate devolves on the question of centralisation of paediatric services; to provide centres with a comprehensive concentration of sophisticated equipment, and, most critical, by concentrating the case material, to create and maintain knowledge and expertise, in a core of doctors in all disciplines.

The major point in these discussions concerns the degree of centralisation which is desirable, which, in paediatric circles is commonly held to be the maximum degree of centralisation possible. Studies of this aspect of the problem has revealed that centralisation may vary from 7 to 50% between regions in the United Kingdom, and from 7 to 25% between regions in Ireland. The degree of centralisation possible will obviously be dependent upon many factors, not the least of which is the urgency with which certain conditions require treatment. Current thinking would seem to suggest that the target to be aimed at is 50% centralisation of services.

The corollary to that recommendation, that at least 50% of children will be treated outside specialised centres, raises immediate implications for anaesthetic practice and training. It is a practical certainty that the new born, and certain forms of specialised surgery, such as cardio-thoracic and neuro-surgery, will be dealt with in the specialised centres. It is equally certain that a large number of infants and young children, with what might be regarded as the more ordinary conditions, or undergoing specialised investigations, will be amongst those dealt with outside the specialised centres; and these, as the study has shown, constitute a particularly vulnerable group. At this point also the figures for respiratory disease, given above, must be considered from another aspect; what catchment area do these figures represent, and, what multiple of those figures represents the annual mortality, from acquired respiratory disease in otherwise normal children, in a population of 3.1 million?. It is quite apparent due to the acute onset of these and many other childhood diseases, that the knowledge and expertise required for their successful management must be widely available outside the specialised centre.

The study, therefore finally confronts us with two of the major problems which beset all anaesthetic training schemes. The first of these is, on the face of it, the more simple; all trainees must have an adequate grounding in the techniques of paediatric anaesthesia and intensive care. This training must concentrate on the assessment, monitoring and management of the infant and the young child, and not the new born. The combined forces of contraception, abortion, euthanasia and genetic counselling, will reduce the volume of new born surgery to such an extent, that only by their concentration in a very few units, will it be possible to generate and maintain the required expertise in a few people.

The second problem, which would arise from any similar study in any other specialised area, has emerged as the major problem confronting all anaesthetic training programmes. In the development of the speciality, from the experienced general practitioner who became an anaesthetist, to the machined product of todays training programme, we may have forgotten that the general practitioner brought to anaesthesia a computerised store of knowledge of patients, diseases, their natural history and response to treatment etc., which he applied instinctively, to the great benefit of the patients whom he anaesthetised. The dilemma, which must be grasped by those responsible for training, is to devise the means by which this knowledge can be imparted to the trainee who enters within a year or two of provisional registration, and in such a fashion that it will develop throughout his training, and his subsequent professional career.

REGISTRAR'S PRIZE

Dr. P.J. McKENZIE

COMPARISON OF SPINAL AND GENERAL ANAESTHESIA FOR PATIENTS WITH FRACTURED NECK OF FEMUR

Fracture of the femoral neck is associated with considerable morbidity and a mortality rate in the range 8.7% to 23%[1-6]. Elderly patients with this condition have a low arterial PO_2 which is reduced further following general anaesthesia[7]. Spinal anaesthesia has little effect on arterial PO_2 and PCO_2s and has been recommended as the best technique of anaesthesia for lower abdominal and lower limb surgery in patients with impaired lung function[9], and for protection against metabolic effects of surgery[10]. Thus we have compared in patients undergoing correction of fractured neck of femur the effects of general and spinal anaesthesia on arterial blood gas values and plasma cortisol concentrations and on mortality during the four weeks following operation.

Patients and Methods

Forty-eight patients with a fractured neck of femur were allocated randomly to receive either general anaesthesia (GA) or spinal anaesthesia (SAB) with light sedation using diazepam as necessary. Pre-medication was not given. All patients received an intravenous infusion of crystalloid for 12 to 24 hours before operation.

Surgery comprised insertion of a J.T.B. nail-plate, a Honey-Capener nail-plate or a K.Y. nail.

S.A.B. Group

Twenty-three patients received 1.3 to 1.5 ml of hyperbaric cinchocaine via a 22G needle, injected slowly with no barbotage. The block was performed with the patient in the lateral position, fractured hip downwards, and no tilt. After the injection, the patient was turned supine and remained horizontal.

G.A. Group

Twenty-five patients received general anaesthesia induced with 1.0 to 3.0 ml of Althesin followed by Suxamethonium 50mg to facilitate tracheal intubation. Anaesthesia was maintained with 66% N_2O and 1% Halothane in oxygen with spontaneous ventilation.

Arterial blood samples were obtained before induction of anaesthesia, one hour after induction, and one hour after the end of surgery. Arterial PO_2, PCO_2 and pH were measured using a Radiometer ABL 1 auto-analyser and corrections were applied for the difference between the temperature of the electrodes and that of the patient. Venous blood was withdrawn for measurement of haemoglobin and plasma cortisol concentrations pre-operatively, one hour intra-operatively and immediately after cessation of anaesthesia.

RESULTS

Age, duration of surgery, blood loss, fluid infused, Hb concentration, and interval between admission and surgery were comparable in each group. No patient in the spinal group required blood, although six were given colloid infusions. One patient in the G.A. Group lost 2250 ml of blood and was given appropriate volumes of blood and colloid solutions.

Table I shows the results of blood gas analysis. The mean intra-operative $PaCO_2$ was significantly higher and the mean pH significantly lower in the G.A. Group in comparison with the S.A.B. Group. There was no correlation between age and PaO_2 measurement made before or after operation. There was a significant decrease in mean PaO_2 and pH in the G.A. Group, but not in the spinal group. The decrease in Hb concentration was not different between the groups.

Table II shows pre-operative plasma cortisol concentrations and increases from these values at 60 min. after induction of anaesthesia, and immediately post-operatively. The patients given spinal anaesthesia showed a significant and sustained increase in cortisol concentration which did not occur in the G.A. Group.

Table III shows the mortality rate over the 28 day period after operation. In the period up to 14 days after surgery, there was no deaths in the spinal group, but five occurred in the G.A. Group. This difference approached statistical significance. All but two of those who died had pre-existing cardiac or respiratory disease. Two previously fit

patients (in the G.A. Group) died from pulmonary thromboembolism.

DISCUSSION

The mean pre-operative arterial PO_2 found in the patients in this study was 9.34 kPa which is similar to values noted in comparable series[7,11,12]. This was accompanied by hypocapnia presumably induced by hyperventilation secondary to increased chemoreceptor drive. There are several possible reasons for low PaO_2 in this type of patient. It is well known that PaO_2 decreases progressively with increasing age; mean age in this study was 76 years. The published regression lines[13–16] of PaO_2 against age have been computed for younger patients than those in this study but it would be misleading to use such data for comparison purposes. Indeed, no correlation was found between age and PaO_2 in the present study or that by Martin[4].

It is pertinent to question if this elderly group of patients exhibit a more severe degree of hypoxaemia than could be accounted for by age alone. Other possible causes of reduced PaO_2 include the supine position in the elderly[17], unsuspected subclinical fat embolus[18,19] prolonged recumbency[20] or reduced cardiac output. Fat embolus is an established cause of hypoxaemia after long bone fractures, but evidence for its occurrence after femoral neck fracture is less convincing but worth consideration.

During and after operation under spinal block, PaO_2 and $PaCO_2$ remained unchanged. This finding is in agreement with other series[8,21,22]. However the patients in the G.A. Group showed a small but significant decrease in PaO_2 at one hour after surgery. Wishart, Williams and Smith[7] also found a similar decrease in PaO_2 in patients receiving 3 different techniques of general anaesthesia for fractured neck of femur.

Spinal anaesthesia has been shown to prevent increases in ACTH[23] and cortisol[24] concentrations – an effect which persists only for the duration of the block. General anaesthesia also prevents increases in plasma cortisol concentrations[24]. Oyama and Matsuki[10] found no change in cortisol concentrations after spinal block but a significant increase after surgery commenced, and they suggest this may reflect emotional stress. The majority of patients who received a spinal block in the present study were unsedated and the ambient noise may have been stressful, reflecting in increased plasma cortisol concentrations. Sedation of the patients was seldom necessary, probably because the spinal block was bilateral and of sufficient height to abolish the discomfort of lying on the orthopaedic table.

The overall mortality at 28 days was 12.5% with only one death out of six in the spinal group. McLaren, Stockwell and Reid[12] also found a lower mortality in patients who had spinal anaesthesia for fractured neck of femur and postulated that this resulted from a lower frequency of pulmonary thromboembolism. In two very large series[1,2] of patients with fractured femoral neck, mortality rates were 10.4% and 20% respectively and the mortality rate increased with age.

Patients in the present study were unselected apart from the exclusion of those requiring a Thompson prosthesis as the use of cement is occasionally accompanied by hypoxaemia and hypotension[25]. It is the policy in the Western Infirmary to operate as soon as possible on all patients with fractured neck of femur with the exception of those in gross cardiac failure, uncontrolled diabetes mellitus, or if they obviously would not benefit from the procedure. On the other hand, Julhunen and Honkonen[26] stated that "The medical condition of 150 patients was so good that the surgeons were allowed to operate on them . . . ."!

The safety and lack of sequelae of spinal anaesthesia have been established in very large series[27,28]. The results of the present study suggest that it may be the technique of choice for lower limb surgery in the elderly, injured patient. Deterioration of arterial oxygen is prevented and there would appear to be an improvement in the extremely high mortality rate which accompanies hip surgery in the elderly.

Acknowledgements

I would like to thank Drs. G. Smith, H.Y. Wishart and K.M.S. Dewar for their advice and help, and Mrs. M. McLeod for her secretarial assistance.

TABLE 1

Arterial blood gas measurements in the two groups before induction, 60 mins after induction, and 60 mins after the end of operation (mean values ± S.E.M.)

Intra-operative PaO_2 values in the general anaesthesia group are omitted as the F_1O_2 was 33%.

All other samples were taken with patients breathing room air.

		GENERAL GROUP		SPINAL GROUP
	Pre-operative	9.48 ± 0.25		9.21 ± 0.33
PaO_2 (kPa)	60 min intra-operative	–		9.00 ± 0.35
	60 min post-operative	8.68 ± 0.29		9.17 ± 0.34
	Pre-operative	4.35 ± 0.12		4.38 ± 0.124
$PaCO_2$ (kPa)	60 min intra-operative	5.45 ± 0.24	⟷ *	4.29 ± 0.107
	60 min post-operative	4.75 ± 0.13		4.40 ± 0.12
	Pre-operative	7.467 ± 0.006		7.456 ± 0.010
pH	60 min intra-operative	7.352 ± 0.015	⟷ *	7.457 ± 0.065
	60 min post-operative	7.422 ± 0.007	⟷ **	7.442 ± 0.008
	Pre-operative	+0.2 ± 0.464		-0.387 ± 0.632
B.E. (m mol. litre $^{-1}$)	60 min intra-operative	-3.004 ± 0.537	⟷ **	1.66 ± 0.477
	60 min post-operative	-2.328 ± 0.445		-1.39 ± 0.43

Significant differences (p values asterisked) between arrowed groups.

* = $p < 0.0005$ ** = $p < 0.05$

TABLE II

Plasma Cortisol (m mol l^{-1}) Concentrations (mean ± S.E.M.)

	GENERAL GROUP		SPINAL GROUP
Pre-operative	814 ± 117		720 ± 76
Increase in cortisol from pre-op value:			
60 min intra-operative	53 ± 50	⟷	204* ± 66
immediately post-operative	-1 ± 53	⟷	261* ± 74

*Significant change from pre-operative value ($p < 0.0025$) by paired Student's t test

Significant differences between arrowed groups ($p < 0.05$) by unpaired Student's t test

TABLE III

Mortality in each group.

Significance of difference between groups assessed using Chi-squared test with Yates' correction.

Days after operation	0 – 7	0 – 14	0 – 28
General group	3	5	5
Spinal group	0	0	1
	$p >> 0.05$	$0.05 < p < 0.1$	$p >> 0.05$

References

1. Barnes, R., Brown, J.T., Garden, R.S. and Nicoll, I.A. (1976). Subcapital fractures of the femur. A prospective review. **J. Bone Joint Surg.** 58, 2.
2. Gallannaugh, S.C., Martin, A. and Millard, P. (1976). Regional survey of femoral neck fractures. **Brit. Med. J.** 2, 1496.
3. Honkonen, K., Tarkkanen, L. and Julkunen, H. (1971). Femoral neck fracture during and after surgery. **Acta Med. Scand.** 189, 173.
4. Martin, V.C. (1977). Hypoxaemia in elderly patients suffering from fractured neck of femur. **Anaesthesia** 32, 852.
5. Allen, H.L. and Metcalf, D.W. (1965). Fractured hip: a study of anaesthesia in the aged. **Anesth. & Analg.** 44, 408.
6. Aldrette, J.A., Davis, H.S. and Hingson, R.A. (1967). Anesthesia factors in the surgical management of hip fractures. **J. Trauma** 7, 818.
7. Wishart, H.Y., Williams, T.I.R. and Smith, G. (1977). A comparison of the effect of three anaesthetic techniques on postoperative arterial oxygenation in the elderly. **Br. J. Anaesth.** 49, 1259.
8. de Jong, R.H. (1965). Arterial carbon dioxide and oxygen tensions during spinal block. **J.A.M.A.** 191, 94.
9. Scott, J.B. and Thorburn, J.T. (1975). Spinal anaesthesia. Editorial. **Br. J. Anaesth.** 47, 421.
10. Oyama, T. and Matsuki, A. (1970). Plasma levels of cortisol in man during spinal anaesthesia and surgery. **Canad. Anaesth. Soc. J.** 17, 234.
11. Phillips, G. and Tomlin, P.J. (1977). Proc. Anaesth. Res. Soc. **Br. J. Anaesth.** 49, 514.
12. McLaren, A.D., Stockwell, M.C. and Reid, V.T. (1978). Anaesthetic techniques for surgical correction of fractured neck of femur. A comparative study of spinal and general anaesthesia in the elderly. **Anaesthesia** 33, 10.
13. Raine, J.M. and Bishop, J.M. (1963). A-a difference in O_2 tension and physiological dead space in normal man. **J. appl. Physiol.** 18, 284.
14. Marshall, B.E. and Millar, R.A. (1965). Some factors influencing postoperative hypoxaemia. **Anaesthesia** 20, 408.
15. Conway, C.M., Payne, J.P. and Tomlin, P.J. (1965). Arterial O_2 tensions of patients awaiting surgery. **Br. J. Anaesth.**
16. Gillies, I.D., Petrie, A., Morgan, M. and Sykes, M.K. (1977). Analysis of possible factors influencing PaO_2 and $(PaO_2 - PaO_2)$ in patients awaiting operation. **Br. J. Anaesth.** 49, 427.
17. Ward, R.J., Tolas, A.G. and Benveniste, R.J. (1966). Effect of posture on normal arterial blood gas tensions in the aged. **Geriatrics** 21, 139.
18. Tachakra, S.S. and Sevitt, S. (1975). Hypoxaemia after fractures. **J. Bone Joint Surg.** 57, 197.
19. Ross, A.P.J. (1970). The fat embolism syndrome: with special reference to the importance of hypoxia in the syndrome. **Ann. R. Coll Surg.** 46, 159.
20. Cardus, D. (1967). O_2 alveolar-arterial tension difference after 10 days recumbency in man. **J. Appl. Physiol.** 23, 934.
21. Catenacci, A.J. and Sampatrachar, K.R. (1969). Ventilatory studies in obese patients during spinal anaesthesia. **Anesth. Analg.** 48, 48.

22. Parkin, S. (1969). Effect of spinal anaesthesia on the pulmonary function of patients with chronic obstructive pulmonary disease. **Ann. Surg.** 169, 35.
23. Oyama, T. (1973). Endocrine responses to anaesthetic agents. **Br. J. Anaesth.** 45, 276.
24. Hammond, W.G., Vandam, L.D., Dans, J.M., Carter, R.D., Bull, M.R. and Moore, F.D. (1958). Studies in surgical endocrinology. IV Anesthetic agents as stimuli to change in corticosteroids and metabolism. **Ann. Surg.** 148, 199.
25. Modig, J., Busch, L., Olerud, S., Suldeen, T. and Waernbaum, G. (1975). Arterial hypotension and hypoxaemia during total hip replacement. **Acta. Anaesth. Scand.** 19, 28.
26. Julhunen, H. and Honkonen, K. (1971). Medical aspects in the treatment of femoral neck fracture. **Acta Med. Scand.** 189, 167.
27. Dripps, R.D. and Van Damm, L.D. (1954). Long term follow up of patients who received 10,098 spinal anaesthetics. **J.A.M.A.** 156, 1486.
28. Noble, A.B. and Murray, J.J. (1971). A review of the complications of spinal anaesthesia with experience in Canadian teching hospitals from 1959–1969. **Can. Anaes. Soc. J.** 18, 5.

COMMITTEE REPORTS

SCOTTISH STANDING COMMITTEE OF THE FACULTY OF ANAESTHETISTS

On his retiral from the Board of the Faculty of Anaesthetists, Professor J.D. Robertson ceased to be a member of the Committee during the year and Dr. A.H.B. Masson retired in rotation. Dr. W.R. MacRae succeeded Dr. Masson as a member of the Committee, and I succeeded Dr. Masson as Secretary. The other elected member of the Committee is Dr. J.B. Kyles of Kirkcaldy and Professor Donald Campbell (the present Chairman of the Committee) sits as an elected member of the Board of Faculty. The Dean of the Faculty of Anaesthetists, Dr. J.E. Riding, has attended every meeting of the Committee throughout the year.

Hospital Practitioner Grade

The efforts of the Committee in the previous year in drawing attention to the possible anomalies of the existing arrangements for the hospital practitioner grade have been particularly successful. It is no exaggeration to claim that the Standing Committee played a major role in the discussions leading up to the drafting of the new guidance to external assessors who are asked to sit on appointments to this grade.

Senior Registrar Tenure of Appointment

The Committee has been concerned that the existing practice in some areas of automatic extension of a Senior Registrar contract after the first year by as much as a further three years may be a disincentive to Senior Registrars to seek promotion when they have completed Higher Professional Training. The problem is highlighted in the case of those who may have one year of Higher Professional Training recognised before they commence work as a Senior Registrar. While the Standing Committee would not wish you to conclude that it is angling for the dismissal of Senior Registrars, it is clear that the present situation is anomalous, bad for the service, and discouraging for those who await promotion to the grade. Representations have been made through the appropriate agencies to the Scottish Home and Health Department and it is now known that the Department and Postgraduate Deans share our concern. It may be that a solution can be found within the existing rules. If not, it is likely that a change in the rules will follow shortly.

Faculty Representatives on Advisory Appointments Committees

In England, an external assessor is entitled to comment on both the job specification and the quality of the candidates; whereas comment on the latter only is allowed in Scotland. As recently as June 1977, the Scottish Home and Health Department has reaffirmed its intention that the present arrangements in Scotland should continue. The threat to anaesthetists and to standards of training is that it might be possible for a job to pass through the various processes, leading to an appointment without proper specification of the type of work involved, or alternatively with a content of work which is clearly not appropriate to a Consultant or to the training needs of the hospital. The Standing Committee feels that the best method of preventing an unsatisfactory job description is to ensure proper advice when the job

description is drafted. Through the Regional Educational Advisers, all Divisions have been reminded of the Faculty's concern about the content of posts and the services of the Regional Educational Adviser or the Standing Committee itself are available to any Division which is in doubt in the course of preparing a draft job description. Clearly, an effective level of co-operation in this matter is important to all of us.

NHS Vocational Training

As you will know, the regulations for Vocational Training include the possibility of a period of study in anaesthesia. The Standing Committee welcomes this move, although it recognises that it is not possible to teach anaesthesia to anything less than a minimum degree of competence in the course of the available period (six months). The Committee feels that training might be restricted to competence in resuscitation and an understanding of the influence of disease on anaesthesia. There are two anxieties: first, the posts are not to be supernumerary and it is important to ensure that there is no conflict between the needs of this scheme and the justifiable preference of Departments of Anaesthesia for those who wish to enter anaesthesia as a career; second, the Faculty of Anaesthetists feels that it should be in a position to lay down criteria for this type of training and that posts would be accredited in the usual way. It is still not clear that the Departments of Health would accept this and it has been hinted that such supervision might be vested in local Postgraduate Committees. This matter is still under review.

Cardiac Surgery

The Standing Committee has considered the planning group's report on cardiac surgery in Scotland. This is an advisory document but in the event of its terms being implemented, formal arrangements would need to be entered to ensure training in cardiac surgery for those who have training posts based outside of Edinburgh and Glasgow.

Faculty Tutor Scheme

The Faculty has approved a new scheme by which a Faculty Tutor would be appointed to each hospital or group of hospitals. This person would have special responsibility for training. We in Scotland should recognise that there are a number of institutions and areas in England in which the introduction of this scheme would be appropriate, but the view of the Standing Committee is that in Scotland there is a good working relationship between the Regional Educational Advisers and the Consultants in charge of teaching in the individual hospitals. Moreover, the great majority of trainees enjoy part or all of their training in proximity to a University Department. Although the Standing Committee is prepared to support the spirit of the Faculty Tutor Scheme, it is anxious that the imposition of an additional tier in a system which is already working satisfactorily should not cause confusion. In general, we take the view that if such a scheme were to be introduced in Scotland, the appointment to the office of Faculty Tutor should normally be given to the Consultant already responsible for teaching.

The Unity of the College of Surgeons

The Standing Committee has given its unanimous support to the President of the Royal College of Surgeons and the Deans of the Faculties and endorse their sentiments in the recent message to Fellows in the College under the heading "The Unity of the Royal College of Surgeons". In particular, the Standing Committee would like to record its appreciation of the qualities of the Dean, Dr. Riding, in what has clearly been a difficult time to hold this important office.

A.A. Spence

SCOTTISH COMMITTEE FOR HOSPITAL MEDICAL SERVICES

The proceedings of this committee have been largely taken up with the new contract discussions this year. The details have been fully published elsewhere and at the time of writing the contract is about to go to the Review Body for pricing.

Other matters of concern discussed during the year have been

(1) The increasing amount of legislation which affects our contracts and working conditions such as Employment Protection Act 1975,

Labour Relations Act 1974, and Health and Safety at Work Act. (Advice on problems with regard to contracts can be obtained from the B.M.A.).

(2) Increments on appointment to the Consultant Grade, which continue to show a disquieting difference between England, where 60% of appointees receive one or more increments and Scotland where the proportion is only 20%. It is now agreed that advisory appointments committees can give advice but not as to the numbers of increments and discretion remains with the employing board.

(3) Distinction Awards. Concern has again been expressed on behalf of the anaesthetists at the disparity between Scotland and England.

The President of the Society attended a meeting with representatives of the Faculty of Anaesthetists and Association of Anaesthetists and the Scottish Sub-committee on Distinction Awards.

D.S. Arthur

NATIONAL MEDICAL CONSULTATIVE COMMITTEE. SUB-COMMITTEE IN ANAESTHESIA

The Anaesthetic Sub-committee of the NMCC in conjunction with the National Dental Consultative Committee established a working party to look into all aspects of general anaesthesia and sedation in general dental practise including hospital dental practice. This group is under the chairmanship of Dr. A.A. Spence and is willing to consider any submissions from anaesthetists concerning this branch of anaesthesia.

Registrars' Meeting

WESTERN GENERAL HOSPITAL EDINBURGH – 25th May, 1978

About forty junior anaesthetists assembled at the Scottish Hospital Centre to attend the annual meeting which this year for the first time was held in the spring. The programme in which several papers on a range of topics of clinical interest were presented was arranged by Dr. K.B. Slawson of the Department of Anaesthesia, Western General Hospital. A feature new to the Registrars' Meeting was the presence of a small trade exhibition.

The morning session was chaired by Dr. Slawson when the following papers were presented:–

"Therapeutic Hyperthermia" – Dr. R.T. Pettigrew

"Drug Interactions" – Dr. I.T. Davie

"Electrical Safety for Patients" – Dr. D. Smith.

Dr. Pettigrew described in detail his technique of using heated wax to treat patients suffering from advanced malignant disease. The aim was to elevate and maintain the patient's whole body temperature to the maximum tolerable limit. The criteria used to assess a successful response to treatment were pain relief, weight gain plus one of the following:– clinical decrease in the size of the tumour on serial measurement, pathological evidence of necrosis on serial biopsy and radiological evidence of regression. Thermal enhancement of irradiation when compared to chemotherapy had the advantages of not causing bone marrow depression, any side effects being immediate, and of treatment being able to be repeated after one week.

In the introduction to the second paper, Dr. Davie highlighted the problem of drug interaction by referring to a case in which a patient had received no fewer than fourteen different drugs during the course of one anaesthetic. When one drug can profoundly modify the action of another it was imperative that the anaesthetist should search for a safe path through the 'therapeutic jungle'. The various types of drug interactions were described and illustrated with examples.

The question "How safe are we in hospital?" was posed by Dr. Smith of the Department of Medical Physics in the final paper of the morning. A multiplicity of electrical equipment existed in hospital ranging from life support apparatus to diagnostic machines but these, while contributing to the patient's wellbeing, could, if faulty, produce less desirable effects such as shock, burns, etc. Dr. Smith discussed the things that had to be done to minimise the risks, among them being careful selection of electrical equipment, paying proper attention to hazard warning notices and ensuring that electrical apparatus did not have such things as cracked plug tops or frayed wires.

In the afternoon, under the chairmanship of Dr. N. Gordon, a further three papers were presented:—

"Prevention of Venous Thrombosis" — Mr. C.V. Ruckley

"Progress in Analgesic Surgery" — Mr. E.R. Hitchcock

"Anaesthesia and other aids for Intracranial Aneurysm Surgery" — Dr. J.L. Jenkinson.

Mr. Ruckley stated that the perioperative problem of deep venous thrombosis and pulmonary embolism resulting from it was one which had been increasing over the last fifty years. The problem with this thrombosis was one of diagnosis and, of patients dying from massive pulmonary embolism, only 20% had deep venous thrombosis diagnosed beforehand. Because diagnosis is so difficult the emphasis must be placed on prophylaxis, especially in high risk patients, using both physical and pharmacological means of which the currently best available is low dose heparin commenced before operation and continued until the patient is mobilised.

The progress made in surgery for the relief of chronic pain was discussed by Mr. Hitchcock, Consultant Neurosurgeon, in the second paper. Although there had been many innovations not much actual progress had been made. As the success rate of treatment was only 60%, patient selection was important and the question to be asked was what was the least procedure that could be done to relieve the patient's pain. Some of the surgical techniques employed were discused and a videotape of the procedure of radiofrequency rhizotomy was shown.

In the final presentation, a videotape demonstrating clipping an intracranial aneurysm was shown after which Dr. Jenkinson described in detail the anaesthetic management of patients with this condition and the aids that were used to facilitate surgery. Among them were the use of EACA prior to surgery to reduce the likelihood of rebleeding from the aneurysm and so allow more time for patient work-up, the use of sodium nitroprusside to provide a period of hypotension when the aneurysm is being clipped and the use of low molecular weight dextran post-operatively to reduce the risk of thrombus formation at the aneurysm site.

News from the Regions

Grampian Region

Now that the heating and ventilation problems which have beset Phase II, the £7,000,000 extension to A.R.I. have apparently been solved, the building has been taken over from the contractors by the Grampian Health Board some four years late.

The opening of the new Casualty Department this month heralds the phased transfer of various surgical and medical units into the building. How quickly this can be achieved is largely dependent on recruitment of the extra nursing staff needed. Sanguine predictions are that further occupation may never occur because these nurses are just not available.

What it means for us is a move into new, but still far from perfect accommodation, in the near future. We will leave our present quarters reluctantly. In spite of all their inadequacies, they have been our "home" for 25 years and are ideally located in the existing building. It also means that moving the Respiratory Unit into new accommodation may become a reality. Nothing could be more welcome for those who look after patients in the existing unit.

Unlike previous years there have been no changes in staff at Consultant or senior register level. Dr. George Riddell has been appointed senior registrar at Cardiff and Dr. Matthew

Chesshyre has taken up a post in the Gilbert and Ellice Islands. He voiced some disquiet lest the inhabitants of these islands reverted to the gastronomic practices of their forebearers following independence. We have not, in fact, heard from him since that date.

Lack of movement of staff at junior level has resulted in a smaller than usual intake of S.H.O.'s with a number of applicants having to be turned down. It is not possible to say whether the increase in numbers seeking jobs reflects a genuine increase in interest in the specialty or merely a result of a higher output from medical school. Whatever the reason, it is likely that difficulty in recruitment locally will no longer be a problem.

Western Region

"Is there any thing whereof it may be said, See, this *is* new? it hath been already of old time which was before us"

Ecclesiastes I:10.

A general air of depression about building and development progress continues in spite of the fact that the long-awaited Rutherglen Maternity Hospital is opened — not as a geriatric establishment as had been feared, but for the purpose originally intended. It would appear that the cause of the declining birthrate in the West of Scotland has been identified and appropriate action has been taken. The new Monklands Hospital is now well established following its opening in 1977. There is active work in a wide range of surgery and the Anaesthetic Department is increasingly involved in the work of the nearby Bellshill Maternity Hospital. The Consultant establishment now totals five: Drs. O.M. Watt, N.G. Johnston, E.J. Pink, F.J. Griffiths and W.S. Dykes, with a Locum Consultant in addition. There are three Registrars and three SHO's, included in the rotation scheme of the Glasgow Royal Infirmary.

The new District Hospital at Kilmarnock is now at the advanced stage of having its opening date delayed — a familiar pattern. Dr. Iain MacDiarmid has been appointed as Consultant based at Ballochmyle Hospital and Dr. Tom McCubbin at Kilmarnock Infirmary. Dr. Alistair Trench has moved from Edinburgh to be Consultant at Stirling Royal Infirmary.

In the more rarefied atmosphere of the teaching hospitals, Dr. Margaret Stockwell has been appointed Consultant at the Southern General Hospital, while Dr. John Henderson has returned from North America to a joint appointment between the Western Infirmary and the Institute of Neurological Sciences. Dr. T.I.R. Williams resigned as a Senior Registrar on his promotion to Hull Royal Infirmary. New appointments to the Senior Registrar grade include: Drs. I.S. Grant, K.M. Rogers, C.D. Hanning, W. MacRae, P. Paterson and R. McDevitt. Dr. D. Braid has been appointed as Honorary Lecturer at the Glasgow Dental Hospital, Dr. A.B.M. Telfer is now Joint Honorary Secretary of the Intensive Care Society and Dr. Graham Smith Honorary Secretary of the Anaesthetic Research Society. Dr. W.L.M. Baird has made a substantial contribution to reversing the brain drain with a visit to Delhi in September.

South East Region

In spite of the many trials and tribulations affecting the N.H.S. this last year, our Departments of Anaesthesia seem to be surviving well.

There have been no Consultant departures but 3 Senior Registrars have gained Consultant appointments: Dr. David Bennie has gone to Dumfries Dr. Alastair Trench to Stirling and Dr. Pin Teh to the City Hospital and Bangour. We wish them luck in their new posts. They are to be succeeded by Drs. David Scott, Neil Renshaw and David Brown. An innovation for this Area is the appointment of Dr. Jane Freshwater to a part-time Senior Registrar post at the Western General Hospital. This post is approved by the Faculty for her Higher Professional Training. We hope further posts of this kind may be created in this Area to fulfil the needs of those who can only complete their training on a part-time basis. The numbers of applicants for Registrar posts appears to be rising. Promotions have been made from the S.H.O. ranks but we are pleased to note that 2 candidates from the South have been appointed.

In the Spring, Professor Robertson resigned from a number of his N.H.S. administrative functions, following which Dr. W.R. MacRae was elected Chairman of the South Lothian Division of Anaesthesia and Dr. R. Burtles to the Chairmanship of the Specialist Advisory Group (a Lothian Area hybrid). Dr. A.S. Brown continues as Chairman in North Lothian District and Dr. H. Turner in West Lothian.

Dr. David Wright continues on Study Leave

from his Lecturer's post until the end of the year. Dr. David Scott is resigning his post of Lecturer in Dental Anaesthesia, at that time to become a Senior Registrar.

It is evident that Phase I of the Royal Infirmary of Edinburgh (containing the new boiler house) is not yet functional to judge from the smoke continuing to be emitted by the old chimney. It is perhaps encouraging that the polythene wraps are now off the cladding of the new building. Life must already be less strenuous for some now that there is an air compressor installed for Ward 19 I.C.U.

We are pleased that this year this Society has chosen an Edinburgh anaesthetist as its President. We would wish to offer Dr. Masson our congratulations and good wishes for his year in office.

On Sepember 1st, the Obstetric Anaesthetists' Association chose Edinburgh for its Annual Meeting. It may be that the location and success of the Meeting had something to do with its President, Dr. D.B. Scott.

Examination results continue at a satisfactory level and provide support for continuing the In-service Courses for the Primary and Final F.F.A.

Following changes at professional level in the Dental Hospital and School, inevitably there have been major changes in the Dental Undergraduate Curriculum. This has resulted in changes in the pattern of teaching Dental Anaesthesia. Dr. David MacLachlan has now established himself in the Dental Hospital and, together with his colleagues whom he has trained, is providing general anaesthetic services in various clinics and in East Fortune and Gogarburn Hositals.

The Medical Undergraduate Curriculum has also been changed so that the students will have a week long attachment in Anaesthesia. They are to be distributed over several Departments of Anaesthesia. We hope that recruiting to the Specialty may be improved by this more intensive exposure to practical anaesthetics.

The Lothian Area Training Scheme for O.D.A.s (worked in conjunction with Stevenson College) continues to thrive. Last June's examination produced a highly satisfactory pass rate. Five Consultant Anaesthetists contribute to this course as Lecturers. The third course has recently started and it is interesting to note that several candidates come from outwith the Lothian Area. So far it appears that none of the previous candidates has left the O.D.A. service.

Tayside Region

The year has been one of stability and relative tranquillity in Tayside. The main advance this year has been the acceptance by the Central Midwives' Board of Scotland of epidural top-ups in labour, following pilot studies including one conducted here by Dr. Milne.

Despite the health hazards associated with anaesthetic practice, three of our staff – Ann Staziker, Bronwyn Williams and Lyn Walton all produced healthy, bouncing baby boys during the year.

The staff changes in the region have all been promotions to senior registrar posts elsewhere – David Brown to Edinburgh, George Macleod who leaves for Nottingham in the near future, and Bill Macrae and Robin Allison to the Western Infirmary in Glasgow. For the second year in succession some of our best golfing talent has gone West – is this a trend for the future? We also congratulate Said Takrouri, who, having gained his F.F.A.R.C.S., has been appointed Assistant Professor in the University of Jordan at Amman.

Finally, we note again with pleasure that there has been no shortage of excellent candidates entering the specialty, particularly from among our own graduates.

Highland Region

The past year in the Highlands has been dominated by two factors. First, the new Surgical Theatres at Raigmore Hospital, and second, the absence of junior staff in the anaesthetic department.

Regular readers will recall from my report last year that construction work on two new operating theatres for Raigmore Hospital was in progress. Sadly I have to report that this progress has been very slow. In the past few weeks we have begun to work in one of these new theatres, seventeen months after the project was started. This so called Phase I of the operation was initially estimated to take seven months. During this period working conditions have been far from ideal and staff, particularly the nursing staff, are to be congratulated on the way they have coped with this situation. As a result of this saga we consider that we now have considerable experience in the

problems of upgrading and would be happy to share this experience with any member of the society who is running into problems of this kind.

At the time of writing, we have been without a Registrar for three months. Bill Kerr left us in August to go to Glasgow. So far, his post and a newly created post are unfilled. Surely someone would like a job in the Highlands with plenty of experience and golf and ski-ing too.

Our S.H.O., Lyn Beytes, got married and went off to general practice in Nairn. She has been replaced by Christine Martin who we welcome.

The only other piece of news I have to report is that construction of Phase II of the New Central Inverness Hospital has started. This project is expected to be completed in approximately six years. We live in hope.

Editorial

There cannot be too many who are satisfied with the conditions in the Health Service in which they now work. The changes of the last decade which radically altered its structure and organisation have contributed to the lowering of staff morale and in addition much of the goodwill which used to exist among its employees has been lost. More recent events, however, would seem to suggest that some groups working in the Health Service may also have lost a sense of morality. At the time of writing, it is particularly distressing to see the disruption to patient care caused by the action or, more appropriately, inaction of a small group of maintenance supervisors. The people involved merely see it as an employee/employer industrial dispute, despite the fact that what they are doing is having an adverse effect on the safety and wellbeing of patients. Sadly it is likely that we will see more of this sort of thing in the future, with other groups in the hospital service, particularly those furthest removed from the patient, willing to use disruption to patient care as a bargaining lever when pressing for their pay demands.

The medical profession has had to cope with more than its fair share of problems in the seventies, many of them as yet unsolved. Will the long-running saga of the Consultant Contract ever end? The main concern for anaesthetists at present, judging by the correspondence in current anaesthetic journals, would seem to be the thorny problem of a future independent College of Anaesthetists. The arguments for and against a separate college are well known and it is not my intention to add to the controversy. The result of the questionnaire sent to the majority of anaesthetists in Scotland by the Council of the Scottish Society indicated that opinion was equally divided on the matter. What may be more significant, however, is that younger anaesthetists showed more enthusiasm for a separate college. That being so, the creation of a separate college of Anaesthetists may well be inevitable in the years to come. We shall see.

For the writer, the last few years at least brought the satisfaction of contributing in a small way to the work of this Society. It has been a privilege to serve the Society. Next year will see a new editor and I would like to take this opportunity of recording my thanks to all those who contributed to this and past issues of the Newsletter and to all those who by their willing help made my task easier.

GLASGOW AND WEST OF SCOTLAND SOCIETY OF ANAESTHETISTS

CURRICULUM 1978–1979

1978

Thursday, September 28th :

Golf Outing – Williamwood Golf Club – 2 p.m.

Saturday, October 14th :

Combined Meeting with Edinburgh and East of Scotland Society of Anaesthetists – **in Edinburgh.**

Speaker – Dr. D.C. Flenley – "Causes, Consequences and Correction of Arterial Hypoxaemia".

Tuesday, November 21st :

Dr. J.G. Jackson Rees – "The Place of Profound Hypothermia in Paediatric Anaesthesia".

1979

Thursday, January 18th :

Professor D.H. Lawson – "Detection and Quantitation of Adverse Drug Effects".

Wednesday, February 14th :

Members' Night – presented by members from Glasgow Royal Infirmary.

Tuesday, March 13th :

Presidential Address – Dr. W.J. Thomson.

Thursday, April 19th :

Annual General Meting.

Unless otherwise stated, meetings will be held in the Royal College of Physicians and Surgeons of Glasgow, 242 St. Vincent Street, Glasgow, at 8.15 p.m.

Tea will be available at 7.45 p.m.

Notice of each meeting will be sent to members.

EDINBURGH & EAST OF SCOTLAND SOCIETY OF ANAESTHETISTS

SYLLABUS 1978–79

Meetings will be held in the Royal College of Surgeons, Nicolson Street, Edinburgh, at 7.45 p.m. for 8 p.m. unless otherwise stated.

1978

Saturday, 14th October :

Combined meeting with Glasgow & West of Scotland Society of Anaesthetists in the Lister Lecture Theatre, Royal Infirmary, Edinburgh, at 5 p.m.

"Causes, Causes, Consequences and Correction of Hypoxaemia" – Dr. D.C. Flenley, Department of Respiratory Diseases, Edinburgh University.

A sherry reception and informal dinner in the Florence Nightingale Nurses' Home will follow the meeting.

Tuesday, 7th November :

Dr. R.T. Pettigrew, Consultant Anaesthetist, Western General Hospital, Edinburgh.

*Tuesday, 5th December :

Professor Donald Campbell, Department of Anaesthesia, Glasgow – "The Anaesthetist and the Management of Major Trauma".

1979

Tuesday, 9th January :

Professor W.D. McLennan, Department of Oral Surgery, Edinburgh University.

Tuesday, 6th February :

Dr. N. Boyes, Research Director, Clinical Research Unit, Astra, Edinburgh.

Friday, 2nd March :

Annual Dinner – Florence Nightingale Nurses' Home, Royal Infirmary, Edinburgh.

Tuesday, 13th March :

Members' Night.

Tuesday, 24th April :

Annual General Meeting.

Parking is available in Chambers Street, South College Street and Bristo Street Car Park.

* This meeting will be held at Ninewells Hospital, Dundee. Full details will be circulated before the meeting.

NORTH-EAST OF SCOTLAND SOCIETY OF ANAESTHETISTS

SYLLABUS 1978–79

Thursday, 5th October, 1978 : Stracathro
"Audio-visual aids and Post-Graduate Education"
Dr. G.D. Parbrook, Glasgow University.

Thursday, 9th November, 1978 : Aberdeen
"The Rational Development of Intensive Therapy"
Dr. J.C. Stoddart, Newcastle.

Thursday, 23rd March, 1979 : Stracathro
Registrars' Papers.

Thursday, 5th April, 1979 : Dundee
"Chloroform"
Dr. H.W.C. Griffiths, Edinburgh.

Thursday, 17th May, 1979 : Stracathro
Annual General Meeting and Presidential Address.
Dr. A.L. Forrest.

Meetings are held at 8 p.m. in Aberdeen Royal Infirmary, Ninewells Hospital and in Stracathro Hospital, Brechin, unless otherwise notified.

Scientific Meeting

Dundee, 17th November, 1978

PROPRANOLOL AND BETA-BLOCKADE IN THE SURGICAL TREATMENT OF THYROTOXICOSIS

Dr. W. Farquhar Hamilton

In the past decade the use of the β-blocking drug, propranolol, in the pre-operative preparation of thyrotoxic patients for thyroidectomy has become firmly established[1,2]. Several published series reported favourably on the use of propranolol to prepare patients for surgery, there being a marked reduction in preparation time, in out-patient attendances and in gland vascularity, compared with the use of conventional antithyroid drugs[3,4].

As propranolol administration does not render the thyrotoxic patient euthyroid, there is a need for a high standard of supervision and assessment of the response to propranolol therapy in thyrotoxic patients, particularly in the peri-operative period. The commonly used resting pulse rate is not a reliable index of β - adrenoreceptor blockade in hyperthyroid patients. We consider that it is necessary to objectively assess the degree of β-blockade by measuring the reduction in exercise heart rate in these patients. We have shown that there is a significant positive correlation between the plasma propranolol steady state concentration and β-adrenoreceptor blockade, as assessed by the reduction in exercise heart rate. A plasma propranolol steady state concentration in excess of 30 ng/ml is associated with a $> 25\%$ reduction in exercise heart rate in hyperthyroid patients.

We have also demonstrated a very wide inter-individual variation in propranolol handling in hyperthyroid patients[5] and it is clear that many of these patients do not achieve adequate degrees of β-adrenoreceptor blockade. This is undesirable as it has been shown that inadequate propranolol dosage in the peri-operative period may lead to thyroid crisis[6].

There is no information on the influence of surgery and anaesthesia on propranolol handling either in hyperthyroid or euthyroid patients. We therefore decided to examine this by measuring the circulating concentration of propranolol before, during and after thyroidectomy in a group of hyperthyroid and euthyroid patients.

There were quite marked and contrasting changes in plasma propranolol levels in the perioperative period. A consistent pattern of propranolol levels, declining from a pre-operative peak to a trough at 8 hours following surgery, and a pronounced rise 24 hours post-operatively was seen both in hyperthyroid and euthyroid patients who received their propranolol dosage orally post-operatively. As the euthyroid patients also exhibited this pattern it is unlikely that

hyperthyroidism per se is responsible for these changes. The decline in plasma propranolol levels resembled the expected plasma drug decay following propranolol "withdrawal" and where dosage administration is ensured by administration of propranolol by nasogastric tube this decline did not occur. The rate of decline is variable and probably determined by a number of factors, including initial plasma level, liver blood flow and intrinsic liver cell clearance. It is clear that the majority of patients are unable due to inability to swallow, drowsiness or nausea, to receive propranolol medication orally in the immediate post-operative period, which thus results in a relative withdrawal of therapy when theoretically it is required most. The levels reached were below those we would normally associate with adequate β-adrenoreceptor blockade.

The marked rise in plasma propranolol 24 hours following surgery was an invariable finding both in euthyroid and hyperthyroid patients. Blood loss was minimal and fluid balance and urinary output in all of these patients were satisfactory. The probable source of this marked rise in plasma propranolol could be an alteration in either liver blood flow or in intrinsic liver cell clearance of propranolol. Whereas surgery and anaesthesia may decrease liver blood flow one would expect these changes to be more pronounced in the early post-operative period rather than 24 hours later. Our finding of markedly elevated plasma propranolol levels four days following surgery suggests that a change in intrinsic liver cell clearance of propranolol may be the possible explanation for this phenomenon.

Unprepared thyrotoxic patients undergoing removal of a toxic goitre demonstrate wide and unacceptable variations in heart rate and arterial pressure[7]. In this investigation, using two different anaesthetic techniques, the stress of anaesthesia and surgery produced only minor changes in heart rate, systolic and diastolic blood pressures, both during and following thyroidectomy. Cardiovascular stability was demonstrated by Trench *et al*[8] in a recent study using a different anaesthetic technique in a similar group of patients. This appears to indicate that the actual choice of anaesthetic technique employed for thyroidectomy, in propranolol prepared thyrotoxic patients, is less important than the degree of control of thyrotoxicosis by propranolol.

In conclusion:—

1. Thyrotoxicosis causes a significant reduction in the plasma propranolol steady state concentration, indicating an increased rate of metabolism.
2. There is a wide inter-individual variation in the plasma propranolol steady state concentration during therapy in hyperthyroid patients. The objective assessment of β-blockade is helpful in the preparation of these patients for surgery.
3. Following thyroidectomy the plasma propranolol levels may fall to below those associated with adequate β-blockade as a result of inadequate administration of propranolol. Its administration via nasogastric tube is an effective way of preventing this.
4. There is a pronounced rise in the plasma propranolol levels 24 hours post-operatively, possibly as a result of an alteration in intrinsic liver cell clearance of propranolol.
5. Cardiovascular stability can be achieved during the following thyroidectomy, using several anaesthetic techniques in propranolol prepared thyrotoxic patients.

References

1. Michie, W. *et al.* (1974), Lancet 1, 1010.
2. McIntosh, D., (1976), J. Royal College of Edin., 21, 197.
3. Bewsher, P.D. *et al.* (1974), Ann. of Surg., 180, 787.
4. Pumstone, B. *et al.* (1976), South African Med. J., 4, 1059.
5. Feely, J. *et al.* (1977), Brit. Med. J., 2, 1352.
6. Ljunggren, J.G. and Persson, B. (1975), Acta Chir. Scand., 141, 715.
7. Goetsch, E. and Ritzmann, A.J. (1934), Archives of Surg., 29, 492.
8. Trench *et al.*, (1978), Anaesthesia, 33, 535.

ENDOCRINE RESPONSE TO SURGERY IN PROPRANOLOL PREPARED THYROTOXIC PATIENTS

Dr. J. FEELY

INTRODUCTION

The response to surgical stress is an important and essential adaptive process which particularly involves both the endocrine and sympathetic systems. There is abundant evidence that catecholamines are important modulators of the glucose response to stress and in addition a major role for catecholamines as central neuroregulators, and transmitter substances in the control of prolactin, growth hormones and cortisol secretion is emerging. Adrenergic blockade with phentolamine and propranolol may reduce the adrenal catecholamine output during stress and β-adrenoreceptor blackade may potentiate and prolong insulin induced hypoglycaemia.

Propranolol alone is widely used[1,2] in the preparation of hyperthyroid patients for thyroidectomy and we have previously reported[3] a reduction in the cortisol response post operatively in these patients. As low plasma cortisols have been noted[4] in hyperthyroid patients (due to increased cortisol turnover) it was therefore necessary to determine whether this reduction in cortisol results from either a peripheral metabolic effect of hyperthyroidism, or a central effect, presumably of propranolol. In addition the glucose response to surgical stress in proporanolol prepared patients was studied.

Patients and Results

Twenty hyperthyroid (mean age 44 years) prepared with propranolol alone and ten euthyroid (mean age 46 years) carbimazole prepared patients were studied. Similar pre-medication, fluids, analgesia, anaesthetic and surgical technique was used in both groups (see Hamilton, 1978). Plasma glucose, cortisol, ACTH, Thyroxine, T_3 and reverse T_3 were determined at present intervals in these patients.

Glucose: There was no difference in the plasma glucose either pre-operatively, intra-operatively, 8 hours or at 24 hours post operatively in both groups. However there was a significant reduction immediately, and for the first 4 hours post operatively in the proporanolol prepared group. Biochemical hypoglycaemia was noted in one patient — the immediate post operative plasma glucose being 2.7 mmol/l and subsequently fell to 2.5 mmol/l at one hour post operatively.

Cortisol/ACTH: Serum cortisol was significantly lower in the propranolol patients pre-, intra-, and at 4, 8 and 24 hours post operatively. The morning cortisol level determined on the day before operation was also lower in propranolol patients and in addition these patients had a normal response to exogenous ACTH.

The plasma ACTH level was significantly reduced in the propranolol prepared patients both pre- and immediately post operatively.

Thyroxine, T_3, Reverse T_3: In both groups there was a minor fall in the serum thyroxine at 24 hours post operatively while the serum T_3 fell and reverse T_3, rose significantly.

DISCUSSION

Stress induced changes in the circulating concentrations of thyroid hormones during surgery are well defined. In euthyroid patients the serum thyroxine rises during surgery with halothane due to a release of thyroxine from hepatic stores. Circulating T_3 concentrations decline markedly not uncommonly into the hypothyroid range probably due to an alteration in the peripheral pathway of thyroxine metabolism leading to increased formation of inactive reverse T_3.

The particularly marked rise in the reverse T_3 in propranolol patients in this study may in part be explained by the preferential degradation of increased amounts of thyroxine to reverse T_3 under the influence of surgical stress and propranolol.

The glucose response to surgical stress was markedly different in the propranolol hyperthyroid patients compared to the control group, being reduced for some hours following thyroidectomy and hypoglycaemia occurred in

one patient. Due to a depletion of hepatic glycogen stores and β-adrenoreceptor blockade of gluconeogenesis, hypercatabolic thyrotoxic patients are matabolically "at risk" and additionally the clinical manifestations of hypoglycaemia may not be obvious in these patients. These results suggest that parental dextrose should be given pre and intra-operatively.

The results in relation to cortisol confirm our earlier study[3] and show a diminished cortisol response in propranolol prepared hyperthyroid patients compared to the control euthyroid patients. It is unlikely that the premedication or post operative analgesia is responsible for this difference as the cortisol levels are lower in the propranolol group on the day before operation and similar medication was used in both patient groups.

The finding of significantly reduced ACTH levels in propranolol patients suggests that depression of the ACTH response occurs both pre and post-operatively in these patients. It seems possible therefore that propranolol, which penetrates brain tissue, is an antagonist (perhaps at hypothalamic level involving the corticotrophin release factor/ACTH release mechanism) of the cortisol response to stress.

Although it must be recognised that the serum cortisol at any given time represents the end point of a number of complex processes including synthesis, transport and binding, storage and metabolism and does not necessarily represent the cortisol concentration at the cellular site, a number of these patients, have plasma cortisols within the "Addisonian" range during surgery.

Although the possible mechanism involved in producing a reduction in the ACTH/cortisol response to stress remains speculative there was no evidence of Addisonian Crisis in any of the patients studied nor did any patient receive corticosteroids. Good anaesthetic management and adequate fluid replacement coupled with a rapid decline in serum T_3 and concommitant increase in reverse T_3 may have a protective effect. However systemic corticosteroids and glucose seem indicated should an emergency such as haemorrhage, sepsis or thyroid crisis arise in the peri-operative period in hyperthyroid patients prepared with propranolol.

References

1. Michie, N., Hamer-Hodges, D.W., Pegg, C.A.S., Orr, F.G.C., and Bewsher, P.D., (1974). Beta-blockade and partial thyroidectomy for thyrotoxicosis. Lancet I 1010.
2. Toft, A.D., Irvine, J., Sinclair, I., McIntosh, D., Seith, sJ., and Cameron, E.H.D., (1978). Propranolol in the surgical management of thyrotoxicosis. New. Eng. J. Med. **298** 643.
3. Feely, J., Browning, M., Forrest, A., Gunn, A., and Crooks, J., (1977). Propranolol and Thyroidectomy — cortisols response to surgery. Ann. Endocrin. **38**, 86.
4. Pitman, J.A., (1971). "Adrenal Cortex" in The Thyroid Ed. Werner and Ingbar, Harper and Rav, 644.

SOME CLINICAL APPLICATIONS OF A NEW TISSUE pH ELECTRODE

Dr. D.K. HARRISON

The value of muscle surface pH measurement as an indicator of poor peripheral perfusion has been widely reported[1,2]. The technique of using a miniature glass pH electrode applied to the surface of skeletal muscle has proved to be of particular value in the monitoring of patients in haemorrhagic shock. In such cases the muscle surface pH falls long before any other changes become apparent. Unfortunately the method is highly invasive since a 2 cm incision must be made in the skin before they can be inserted. Smaller muscle pH sensors have been made[3,4], but these are still large enough to cause significant damage to surrounding tissue.

As a continuation of skin perfusion studies[5], we have designed a pH micro-electrode which can be used clinically to measure extracellular pH in skin[6]. The purpose in constructing such an electrode was to investigate whether a skin, rather than muscle, pH change could be used as an index of reduced tissue perfusion in shock. If so, a much less invasive monitoring technique could be devised. Skin was chosen as the organ to study because of its accessibility and the fact that a change in its appearance and temperature can be the earliest signs that a patient is in shock.

Our micro-electrodes have a tip diameter of approximately 50 microns. They are made from 0150 pH-sensitive glass and are insulated internally by means of a lead-glass micropipette. Their mean sensitivity is 55.5 mV/pH at 35°C, and their mean response time is 40 seconds. The pH electrodes are used in conjunction with a single reference micro-electrode, also of 50 microns tip diameter. This takes the form of 2% Agar in 4M potassium chloride in which is immersed a silver/silver chloride wire. The electrodes are connected to a 5-channel electrometer, each channel having an input impedance of $10^{14}\Omega$. The electrometer is isolated for patient safety. pH and temperature measurements are recorded on a 6 channel pen recorder.

Before use in skin, the 5 pH electrodes are calibrated against the reference electrode in phosphate buffers at 33°C, then they are sterilised in a 2% solution of glutaraldehyde ("Cidex"). When inserting them in normal skin it is easier to puncture the dermis first, using a 25 gauge hypodermic needle, but the electrodes are themselves strong enough to puncture the ischaemic skin of some patients. After use the electrodes are re-calibrated, again at 33°C, but also at 23°C so that allowance may be made for any skin temperature variations.

Measurements have been carried out in the legs of 40 different healthy volunteers under normal, ischaemic, hypoxic and hypothermal conditions. The normal value for skin pH was found to be pH 7.54 ± 0.09 (S.D.). There was no difference in this value between males and females, nor between different parts of the limb.

Ischaemia was produced in the limbs of 20 volunteers by inflating a thigh tourniquet to 20 mm HG for 20 minutes. This caused a fall in the skin pH value of 0.12 ± 0.05, which rose again to normal during the 20 minute period following release of the cuff.

10 volunteers were given a hypoxic mixture (50% air/50% nitrogen) to breathe for 10 minutes. Serial samples of arterialised venous blood were taken throughout the experiment so that blood gas and pH values could be measured, and respiration rates were monitored continuously. Skin pH values reflected the respiratory state of the subject, but were more sensitive than blood pH to the resultant lactic acidosis.

The effect of temperature on skin pH was investigated because of the variability of surface temperature in areas affected by acute or chronic ischaemia. The skin surface of the left feet of 10 subjects was cooled by 10°C using a cooling coil, whilst monitoring the skin pH levels proximal to the coil, and in control areas in the calf and thigh. The mean temperature coefficient of skin pH was found to be −0.023 pH units per °C increase in temperature.

We are using the micro-electrode technique to measure skin pH in the ischaemic limbs of patients with peripheral vascular disease. The 12 patients studied so far had varying degrees of lower limb ischaemia, but in the majority of cases the skin was in a gangrenous or pre-gangrenous condition. In each case one pH electrode was inserted in the thigh, two in the calf, and two in the dorsal aspect of the foot. Temperature corrections were made to pH values using skin surface and thermographic measurements.

The mean value of the skin pH in the thighs of the 12 patients was 7.54 ± 0.08 (the normal value for skin pH). The mean calf skin pH was 7.49 ± 0.09, and the mean pH in the feet was 7.30 ± 0.13. The pH differences between the foot, calf and thigh readings were all found to be highly significant.

Our study of skin pH has been extended to patients under intensive care. 14 Measurements were carried out on 6 patients, all of whom underwent some form of cardiovascular surgery, after which they were immediately transferred to the I.C.U. Arterial samples were taken at the time of skin pH measurements, and blood gases and pH values were measured. A normal skin pH value was obtained from each patient either pre-operatively, or after the patient had fully recovered from the operation.

Skin pH values were in agreement with the arterial blood gases and pH of five of the patients, and hence reflected their acid-base status. The sixth patient lost considerable quantities of blood and was in haemorrhagic shock. Low skin pH values were observed despite a normal arterial blood pH, indicating that skin pH can be an indicator of peripheral perfusion in shock.

In summary, the micro-electrode which we have developed to measure skin pH has proved to be a valuable and reliable research tool. The results from its use in laboratory and clinical situations are indicative that skin pH can reflect acid-base status, or the existence of peripheral ischaemia. The work, therefore, has pointed out two areas where skin pH monitoring could be of considerable clinical importance.

References

1. Couch, N.P., Dmochowski, J.R., Van de Water, J.M., Harken, D.E., and Moore, F.D. (1971). Muscle surface pH as an index of peripheral perfusion in man. Ann. Surg. **173**, pp. 173–183.
2. Van de Water, J.M., Philips, P.A., Linton, L.A., Borst, R.W., and Fisher, W.R. (1972). Muscle surface pH monitoring. Arch. Surg. **104**, pp. 799–805.
3. Herbert, N.C., and Deleault, R.R. (1976). The art of making small glass electrodes. In: Ion and Enzyme Electrodes in Biology and Medicine. ed. Kessler, M. pp. 131–135. University Park Press.
4. Leblanc Jnr., O.H., Brown Jnr., J.F., Klebe, J.F., Niedrach, L.W., Slusaczuk, G.M.J. and Stoddard Jnr., W.H. (1976). Polymer membrane sensors for continuous intravascular monitoring of blood pH. J. Appl. Physiol. **40**, pp. 644–647.
5. Spence, V.A., and Walker, W.F. (1976). Measurements of oxygen tension in human skin. Med. Biol. Eng. **14**, pp. 159–165.
6. Harrison, D.K., and Walker, W.F. (1977). A new design of glass micro-electrode for extracellular pH measurement. J. Physiol. **269**, pp. 23–25 P.

GILLIES MEMORIAL LECTURE

Professor J.G. ROBSON, C.B.E.

Mr. President, ladies and gentlemen, I find myself today among many old friends who will I have no doubt, take as much pleasure in remembering the late Dr. John Gillies as it has given me to be asked to present this first memorial lecture. The invitation to do so is a great honour.

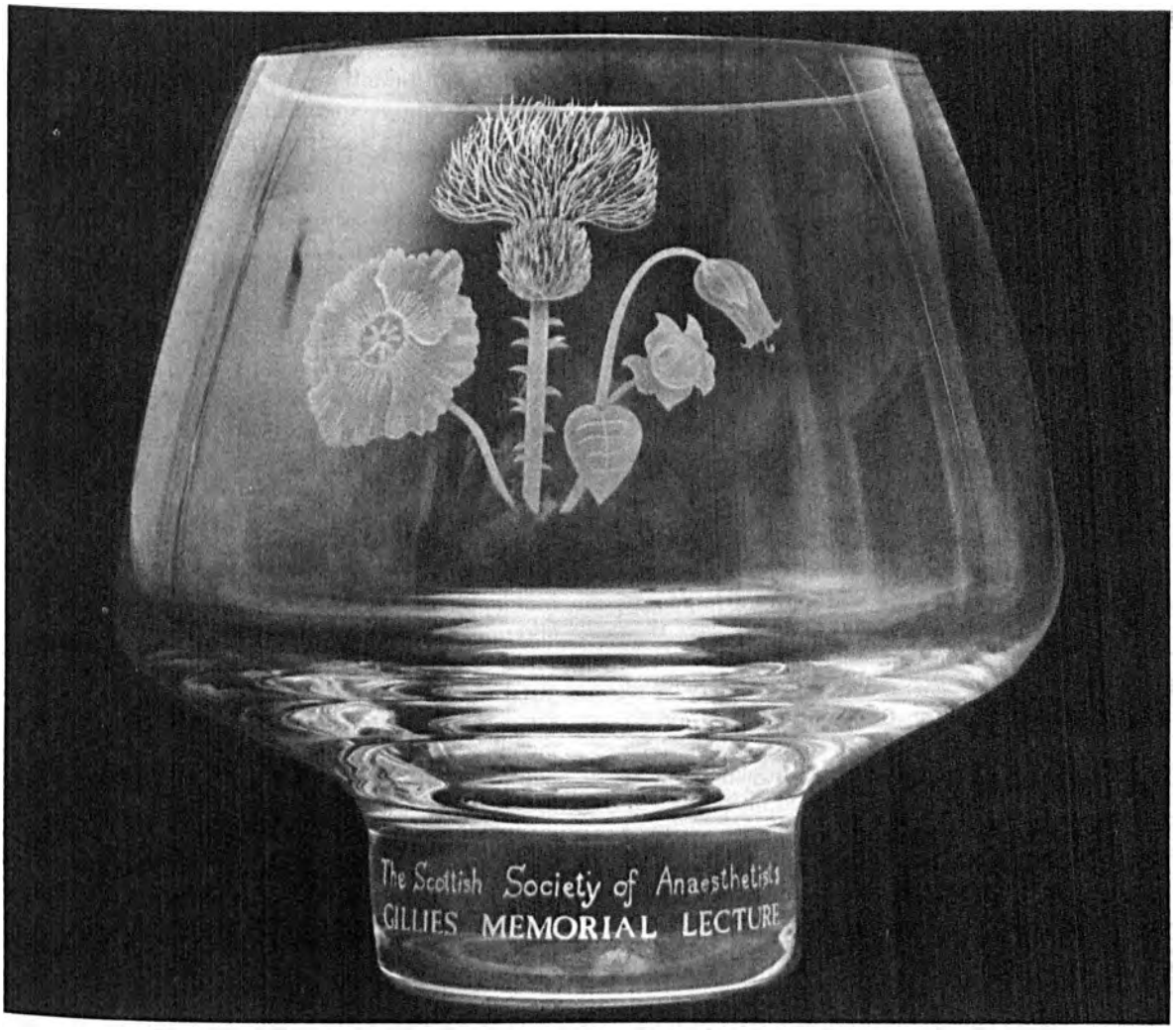
I have chosen "Physiological Trespass" as my theme because by this phrase John Gillies conveyed to anaesthetists and to the medical profession in general, that anaesthesia had entered a new era. He assisted in the birth of this and worked diligently all his professional life to gain recognition for the specialty for what it had then become. John Gillies did not write as many papers as has now become fashionable for Readers in University departments, but what he decided was important enough to communicate was really important, and twenty or more years later is still highly relevant to our practice today.

He had a generative influence on the practice of anaesthesia through his other activities and it would surprise me greatly if many members of the Scottish Society really knew of the position which John Gillies came to occupy in anaesthetic affairs in the United Kingdom. He so rarely talked about himself and his activities that one had to find out elsewhere what he had been "up to" when significant events occurred.

John Gillies spoke to the Society six years ago in "Retrospect" a task which I am sure he did not approach with great relish. On re-reading this when starting to prepare this address, I found that he had made only the lightest and most passing reference to his part in anaesthetic affairs, particularly with respect to the Faculty of Anaesthetists and the Association of Anaesthetists of Great Britain and Ireland. He merely said, "Down the years, supported by a band of loyal colleagues, it has been a unique privilege for me to share in the rapid and striking progression of anaesthetic practice from a dubious restricted art to a broad-based comprehensive discipline . . . "It was indeed a unique privilege, but one for which his natural talents and abilities fully suited him, and it was not due to a series of random events that he found himself in a position to share in the development of the speciality. I am also sure that when he spoke of loyal colleagues he did not just mean those with whom he worked on the Faculty and the Association but principally his immediate colleagues in the Department in the Royal Infirmary of Edinburgh and all Scottish anaesthetists.

I believe it would be helpful to outline his early career and to deal briefly with the state of the specialty of anaesthesia and its institutions in his time, so that we may better appreciate the momentous changes which came about during his working life, and what part he played in this development.

He had an early introduction to anaesthesia when he became a "Junior" houseman as a student after the first world war and he became competent in the restricted methods of the day. Although the General Medical Council did not make theoretical and practical instruction in anaesthesia compulsory in medical schools until 1946, every new houseman had to give anaesthetics and therefore most students learned when they had the opportunity to do so. John Gillies did much better



This bowl in clear Caithness glass incorporating the Society's insignia will be presented each year to the Gillies Memorial Lecturer.

Members of Gillies Family with The President & Professor J.G. Robson.

Dr. D. Gillies Presenting Gillies Memorial Bowl to Professor J.G. Robson.

than most and must then have been attracted to the challenge which anaesthesia then offered. He was of course what we would now call a mature student and probably took his responsibilities and studies rather more seriously than today's school leaver. This maturity arose from four years as a combatant officer in the Highland Light Infantry and being awarded the Military Cross for conspicuous gallantry in the Great War.

He pursued his interest in anaesthesia during his general practice days in Yorkshire and after eight years of this he decided to make a career as a specialist anaesthetist. He therefore went to London and learned what he could from the specialists of the day. There were men of great talent in anaesthesia in London as there were elsewhere, including Scotland, but nowhere were they so concentrated as in the London teaching hospitals. Younger members of the Society will note that there were no organised postgraduate courses, and no study leave with pay and expenses at that time.

To specialise in anaesthesia in 1932 required great faith, talent well above the ordinary, and firm resolve of purpose. It was no easy option to make a career as a proper specialist in anaesthesia when in general, anaesthesia was looked upon as something to do to relieve the boredom of general practice or as a hospital activity which required little training and no academic discipline comparable to other specialties, although it did require some practical ability to do it well. Right up until the second world war anaesthesia in the great majority of British hospitals differed very little from that practised in 1918. Open methods with ether and chloroform, the occasional use of the Boyle's machine with nitrous oxide, oxygen and ether or chloroform, and spinal analgesia usually administered by the surgeon himself were prevalent. In my own introduction to anaesthesia as a student houseman in a peripheral hospital in 1941, these were the techniques I learned. Of course only a minority of anaesthetics, even in teaching hospitals were given by specialists who practised to entirely different standards, and until I learned how to pass an endotracheal tube from one of them that technique was not available in the hospital.

In 1932 John Gillies returned to Edinburgh to a post in the Royal Hospital for Sick Children and he undertook to work for three waiting days in the Royal Infirmary. His remuneration for this work was approximately £1 per working day but of course he soon built up his practice outside the hospitals as was the custom of the time. To be able to establish himself was of itself evidence of a high degree of competence and he had obviously gone to London with a prepared mind and had profited by his experience. Incentives were rather harsher in those days.

Until the use of curare became established in Britain in the immediate post-war years, an anaesthetist's reputation and indeed his livelihood, was very firmly based on his art, and technical competence was all that really mattered to many surgeons. You would be unlikely to prosper if you always had difficulty with induction of anaesthesia or ran into trouble during the course of surgery. For those of you who have not tried I would recommend a little practice at inducing anaesthesia with thiopentone and following this with nitrous oxide, oxygen and ether; slipping down a nasal endotracheal tube at exactly the right and earliest moment; to have the patient relaxed and ready for abdominal surgery in the time it took for the surgeon to scrub up and the theatre sister to lay out her instruments. Swift surgery, large lists and rapid turnover of patients soon sorted out the incompetent.

Individual specialists like John Gillies soon attained the respect of their surgeons, relaxed into happy symbiosis and worked as technically competent doctors rather than technicians. In general however, the standing of anaesthesia as a specialty was not high. After a promising beginning when anaesthesia was introduced it made huge strides from the work of such great men as John Snow, Joseph Clover and Sir James Young Simpson, but thereafter it lapsed into almost a century of very slow improvement and halting progression. Wars always improve medicine, perhaps because it makes men pay attention to things that they would otherwise leave alone and both great wars in this century provided a major stimulus to anaesthesia. By the nineteen thirties the stimulus of the Great War had been absorbed, surgeons were easily satisfied and provided they could operate they could also keep an eye on the patient's condition. Perhaps it was sufficient that operations could be done at all without pain and although mortality and morbidity were by today's standards horrifyingly high, they were generally accepted as being inherent in anaesthesia. One might be excused for wondering why John Gillies and the others of his time decided on anaesthesia as a career; yet there

are many examples of clever men seeing an intellectual challenge and opportunity inherent in fields of endeavour accepted generally to be entirely unpromising.

In an early attempt to improve anaesthesia as a career choice for the generality of doctors rather than only for those few clear-sighted pioneers, a Dr. Silk of London founded the Society of Anaesthetists of London in 1893 which gained a membership of 40. Its aims were simple, the discussion of anaesthesia and its problems. This society became incorporated in the Royal Society of Medicine in 1908, but by 1930 anaesthetists found it limiting that their activities were restricted to the scientific aspects of the subject by the rules of the Royal Society, and in 1932 founded the Association of Anaesthetists of Great Britain and Ireland. The Association was then the appropriate body to interest itself in the welfare of anaesthetists as well as in anaesthesia. It was a body to promote the interests of the specialty and the most competent Dr. Henry W. Featherstone was its first President.

The Association took care not to encroach upon the field of interest of the Section of Anaesthetics of the Royal Society of Medicine, ofen a matter of fine judgement but its scientific aims were clearly expressed by Dr. Featherstone in 1946 as, "The Association's scientific contributions have been either in answer to outside enquiries or for the purpose of impressing on other bodies that certain action by them was advisable."[1] This is still the case although with the National Health Service as we find it today it seems to be as much concerned with terms and conditions of service of anaesthetists as it always was.

Dr. Featherstone expressed the state of anaesthesia in 1930 with great clarity and perception as, ". . . .the practitioners of this branch of medicine had no means of organising their department nor of representing the needs of the anaesthetic service. No standard of training had been laid down and there was very little means of distinguishing trained workers from unskilled but optimistic novices. This was unsatisfying for patients, for surgeons and for hospital authorities, while skilled anaesthetists were inclined to feel that devotion to this branch of the profession had exposed them to an unstable career where "goodwill" could not be established, the problems of routine work could not be voiced, and there was no official body to whom medical or lay authorities could turn for guidance."

In its early days the Association Council met in the London Clinic and by the end of the first year it had a membership of 120 and had decided to limit it to 150. This gives some insight of itself because most cities alone today could produce 150 anaesthetists. The first annual report in 1933 indicated that progress in recognition of anaesthetists was likely to be slow – evolutionary rather than revolutionary – but nevertheless the Association had already set about the foundation of a Diploma in Anaesthetics. Its sub-committee on the D.A. reported in 1934 and under the aegis of the Conjoint Board of the Royal College of Physicians of London and the Royal College of Surgeons of England it set up the examination in 1935. What a significant milestone that was for anaesthesia, perhaps only equalled by the astoundingly far-sighted action of Lord Nuffield in setting up a chair of anaesthesia in the University of Oxford.

It was with this background to the specialty that John Gillies came to be concerned with national affairs when he was elected an ordinary Fellow of the Association, being nominated by Dr. Minnitt and seconded by Dr. Marston in 1942 and he was elected to the Council of the Association in 1943. This was the starting point of more than twenty years of influence on the development of the specialty in the United Kingdom and throughout the world. His continuing engagement in national affairs from 1943 until his retirement in 1966 of itself is an enduring tribute to John Gillies' abilities. This was shortly before the end of the war and the Beveridge Committee was sitting, taking evidence for its report which eventually resulted in the formation of the National Health Service. The Association was represented on the Committee and as an interesting sidelight it made the recommendation that there should be 20 specialist anaesthetists per million of the population but it doubted that there would be sufficient specialists to fill this number of posts.

The immediate post-war years were the most interesting and crucial years for the specialty, with rapid and radical change in a society wearied by war, by the huge influx of anaesthetists from the armed forces returning to civilian life and by the pressures put upon medicine through the acceptance of the Beveridge Report and the start of the Health Service. The Association had very quickly to abandon its exclusive membership limitation, so that the membership rose by 108 in

1946 alone. It set up the journal Anaesthesia with Dr. Langton Hewer as Editor and John Gillies as representative for Scotland and, most important to my theme it elected John Gillies Vice-President in 1946 when Dr. Marston was President.

All the post-war environmental changes brought with them opportunities which required careful and skilful negotiation to ensure that changes occurred in the right direction. Anaesthetists had served in the armed forces in great numbers as equals of other specialists in standing and rank and there was much goodwill among surgeons to see that they should be regarded as equals in civilian life. Sir Alfred Webb-Johnson, later Lord Webb-Johnson, President of the Royal College of Surgeons of England addressed the Association in April 1947 and indicated that he had represented to the Spens Committee that anaesthetists should be regarded as equal to other specialists in status and remuneration but, he said, it was clear that they would have to assume greater responsibilities and it would have to be made obvious that the scientific attainments of anaesthetists were greater and this meant a higher standard of examination. This required a primary examination in basic sciences. He suggested that a Faculty of Anaesthetists should be formed and that the D.A. should be changed to raise its standards and incorporate a primary examination in basic sciences.

I imagine that Dr. Marston who was the Association representative on the Council of the College and John Gillies had had much to do with the discussions leading to Sir Alfred's suggestions. In the event, the Association welcomed these measures and events moved swiftly. John Gillies became President of the Association in October 1947 and Dr. Marston Vice-President so that these two men occupied the most vital positions at this highly critical time for the specialty. They were aided by a most able Association Council whose names now form a roll of honour in our still very young specialty.

The Association formally requested the Council of the College, to set up a Faculty. This was agreed on 12th February 1948 and a Joint Committee between the College and the Association was appointed to determine the appropriate arrangements. Sir Alfred was chairman with the two Vice-Presidents, Sir Cecil Wakely and Mr. Norbury together with Mr. Souttar, Mr. Paterson-Ross and Sir Reginald Watson-Jones. John Gillies led the Association side with Dr. Marston, Dr. Low, Dr. Bernard Johnson, Dr. Edwards and Dr. Murtagh.

This Joint Committee set about its business with alacrity and reported only 13 days later on 25th February, the report being accepted by the College Council at the March meeting and the newly formed Board of Faculty held its first meeting on 24th March 1948. That is, it took just over one month from the formal request for a Faculty to the first meeting of its Board as a Faculty within the College. The Board was appointed by the Council of the College in consultation with the Association, although one must assume that consultation was with John Gillies and Dr, Marston, and Dr. Marston was appointed Dean. The new Board had a three year term of office, thereafter to be elected by postal ballot.

The succeeding history of the Faculty must be known to most of you and John Gillies as an original Board member had an important part to play. At the first meeting that March they decided to start the Fellowship so that they must have laid out their policies before the Board was formed. Starting the Fellowship was not so easy as it might sound to you today and John Gillies was given the task of being Chairman of the Fellowship Committee. The problems were fairly clear. There were in 1948 many anaesthetists in whole-time and part-time anaesthetic practice who had taken the D.A. under its original regulations which had stood for 12 years. When the regulations were changed in 1948 in response to the wishes of the Association they demanded a much higher standard and introduced a Primary examination so that the Committee had to consider what to recommend about the diplomates in relation to the Faculty. Under John Gillies' wise guidance this went extremely smoothly and, as a senior registrar at the time with Dr. Pinkerton in Glasgow I heard of remarkably few grumbles or worries about the problems which must have arisen and which were solved over the next few years. Dr. Gillies had an excellent supply of the milk of human kindness and took the long view as a matter of habit. By the next Board meeting in June his committee recommended that 150 Fellowships should be conferred over the next two years including the twenty-one members of the Board itself. The Society might be interested to note that among many others the names of Dr. Pinkerton, Dr. W.M. Shearer and Dr. W.B. Primrose were in the original list, but the whole list would present no strangers

to the anaesthetists of today, for they were the specialists who taught, wrote and maintained high standards throughout the country.

The Faculty set to with great vigour to repair the deficiencies which had accrued in the past because there had been no educational body, and very shortly they had established patterns of activity which have been maintained and strengthened progressively in the ensuing thirty years. The Faculty became concerned with the maintenance of standards of professional knowledge and skill, with the encouragement of education and research and the utilization to the best advantage of skills and resources. They did not define their aims in so many words because these are from the terms of reference of the Joint Consultants' Committees in England and Scotland, but of course as such, they are derived from the activities of the Colleges and Faculties.

It is of interest that the Fellowship was designated as the FFA, (comma) RCS England but on representation of the Faculty of Advocates in Edinburgh that they designated their Fellows as F.F.A., it was changed by the Board to run the letters F.F.A.R.C.S. together. By 1949 there were 803 members and Fellows of the Faculty; and now, thirty years later we have 3,852 Fellows of whom 2831 are in practice in the United Kingdom and there are 1128 holders of the D.A. It is interesting to note that in the U.K. there are 51 Fellows of the Faculty per million of the population and since 1949 the recorded death rate related to anaesthesia has fallen from about 630 per year to about 100 per year in 1973. It is fairly safe to deduce that the two figures have a direct relationship. The high standard set by the new two part 1948 style D.A. presented its own problems. No longer was there an examination which could be taken as an indication of some attained standard of training and knowledge by those who wished to practice anaesthesia but not to attain consultant standard. The pass rate in Part I was only 20 to 25% and in Part II about 30% in 1948 and 1949 so that in 1951 it was decided to institute the Fellowship by examination. The D.A. reverted to its former status and those who had taken the two part D.A. were awarded the F.F.A.R.C.S. Thus the Fellowship committee smoothly accomplished the transition into the new arrangements and the specialty settled down to earn its new found status.

In 1949 John Gillies was made a Commander of the Royal Victorian Order for services to King George VI and in October 1951 he was presented with the Liston Victoria Jubilee Prize of the Royal College of Surgeons of Edinburgh. These honours illustrate how very highly he was regarded in Edinburgh. He was elected Vice-Dean of the Faculty of Anaesthetists in 1956 and served for two years but in 1959 to 1960 served an additional six months as Vice-Dean. It must have been very difficult in the 1950's to carry out the heavy duties required by the Faculty while living in Edinburgh and it would have verged upon the impossible to be Dean of Faculty and still maintain any form of anaesthetic practice. As it was all these activities must have entailed considerable personal sacrifice although I am certain that he did not look at it this way.

In preparation for this address I browsed widely into past events in the development of our specialty to see where John Gillies had been involved and that turned out to be in almost everything of note that happened. For example, the Centenary celebrations of the discovery of anaesthesia were held in the Royal College of Surgeons on 30th October 1946. The Association had its headquarters in the College at that time and was responsible for the organisation and running of the events.

A plaque was erected by the Association in the main hall of the College which was unveiled by Her Royal Highness the Princess Royal. It was to mark the Centenary and ". . . to keep the memory of four British pioneers whose names will be held in honour from generation to generation." Henry Hill Hickman, James Young Simpson, John Snow and Joseph Clover. An interesting account of this was written by the late Professor Wesley Bourne of Montreal, who attended as an official delegate of the Canadian and the American Societies. (Mysterious Waters to Guard (Wesley Bourne) Blackwell Scientific Publications, Oxford 1955).

A dinner to mark the occasion was held in the Great Hall of Lincoln's Inn at which Sir Alfred Webb-Johnson gave a eulogy of the achievements of the Association and John Gillies spoke for the guests. This was a notable event to mark an important milestone, but it is true to say that the following two or three years saw greater progress than the preceding century had achieved for anaesthesia.

Another important institution was founded in 1955, the World Federation of Societies of Anesthesiology which came about at the First

World Congress held in Scheveningen in Holland. John Gillies was a speaker in the scientific section and a delegate for the United Kingdon, or, as it was referred to at the time, Great Britain. He was elected to the executive committee. I only mention this because I had the pleasure of attending this meeting and I vividly recall the official reception in the Ridderzaal where John Gillies took me round and introduced me to at least ninety per cent of those attending. He was known to everyone and indeed knew them all by name, where they worked, what they had achieved and enlivened this by stories and anecdotes as we went along. To a young and new consultant this was a memorable experience. I learned more about the anaesthetists of the world in two hours that evening than I could have achieved in years of travelling. He recounted from wide experience, much travelling and twenty or more years of interested involvement in the specialty; but more than that, it was all retailed in his inimitably humourous manner which always leavened his total recall of people and events.

I have recounted enough of the history of our specialty and the part played in the development of its organisations by John Gillies. We now have three main national institutions in anaesthesia all of which he helped to establish and with clearly defined functions. The Association looks after the interests of its members as well as ensuring that the terms of service are in the interest of the public and carries out such investigations as it needs to do; the Faculty which is concerned with the standards of education and training in anaesthesia and the standards of practice, and the Royal Society of Medicine which has scientific aims. To some extent the edges are blurred because no one can have a monopoly on education but the central aims are clear. John Gillies was a powerful force for national unity in these institutions and always set himself firmly against narrow nationalism and sectional interests, and the strength of the Faculty to a large extent resides in that it represents anaesthetists in the whole Kingdom. It has, for example been a great strength to Scottish anaesthetists that they have with them the rest of the United Kingdom.

John Gillies also had great contributions to make to the art and science of anaesthesia and of course his involvement in the institutions arose out of his standing as a specialist. His professional career spanned the development of anaesthesia from pure empiricism through to the present day and he had much to do with this. As he himself said in "Retrospect" he had realised a long-cherished ambition, "to see the integration of training in basic sciences, clinical medicine and surgery with the theory and practice of anaesthetic administration and its important ancillary, patient care. By virtue of such training a well merited elevation to equality with other disciplines has been achieved."

For his 1951 address as President of the Section of Anaesthetics of the Royal Society of Medicine he chose the title, "Physiological Trespass in Anaesthesia"[3] because he clearly saw that anaesthesia had moved very radically away from the principles established about a hundred years before. He was concerned that we should recognise that we could now take over the maintenance of respiration, we could control muscle contraction and tone and we could control the blood pressure and bleeding, independently from the anaesthetic state, and so he pointed out the end of an era. We no longer use the full pharmacological scope of complete anaesthetic agents and inflict their toxicity, we trespass on physiological processes in an exact way and John Gillies' own contribution lay in his work with Dr. H.W.G. Griffiths on the control of bleeding.

The paper which they published in 1948[4] was perhaps the most important contribution. It is chiefly remarkable for their exposition of the scientific basis of the technique of total spinal sympathetic blockade which they had developed and practised. There is no doubt that the results of its use in thoraco-lumbar splanchinectomy and sympathectomy were impressive and few anaesthetists of the day would have backed their own judgement to such a remarkable extent. Although the surgical treatment of hypertension has gone out of fashion they were able to produce not only an acceptable technique for anaesthesia so that surgery could be carried out at all, but also they were able to demonstrate some important physiological principles of blood flow and tissue nutrition in relation to blood pressure. Above all they developed a technique, securely based on physiological principles which added a new dimension to the activities of anaesthetists. Not many anaesthetists practice total spinal sympathetic blockade; at least deliberately today, because of the fall from fashion of spinal analgesia but in almost exactly three decades since that

paper was published, control of the circulation in terms of arterial pressure and of bleeding has been practised and refined on those sound principles.

In his Clover lecture[2] in 1950 John Gillies spoke of the factors concerned with bleeding during surgical operations which are to some extent under the control of the anaesthetist. He considered bleeding to be a problem associated with modern light anaesthesia which kept circulatory reflexes active and he advocated again the value of spinal sympathetic blockade for its control. Members of the Society will recall that in 1949 pentamethonium and hexamethonium were introduced and used for the first time to produce autonomic ganglion blockade in surgery in 1950. John Gillies held the opinion that they were not aesthetic in use, because they blocked both the sympathetic and parasympathetic ganglia and did not simultaneously provide sensory or motor paralysis.

Nearly thirty years ago, the pronouncement that, when the body is horizontal, "A low head of arterial pressure associated with vasodilatation and a normal blood volume carries less potential danger than the illusory higher pressure which accompanies vasoconstriction and a reduced blood volume" was calculated to rouse extreme opposition from most physicians and surgeons, who in my experience in those days used to scan the anaesthetic blood pressure record for evidence of the slightest reduction in pressure during operation to which some complication or other could be attributed. Most had then little idea of the importance of flow and metabolic sufficiency rather than the perfusion pressure. Nowadays none would quarrel with the pronouncement and indeed physicians and surgeons have learned to produce vasodilatation to ensure adequate tissue flow.

Perhaps the most attractive and scientifically sound recommendation was to allow spontaneous respiration during total spinal sympathetic blockade for this has many advantages in terms of safety. The normal intra-pleural pressure swings aid venous return and prevent a gross reduction in cardiac output through excessive pooling of blood, and the presence of breathing is an excellent cerebral function monitor indicating that cerebral blood flow has not been compromised. Patients are being lost today because epidural analgesia and muscle relaxants are being exhibited together – removing these safety factors.

Safety was the tenor of all John Gillies' teaching. Whatever you do to patients the risk should be balanced against the necessity for doing it and safety is paramount, even with major physiological trespass which has to be done because of surgical necessity.

The academic excellence of the Royal Infirmary Department of Anaesthetics started of course with John Gillies and has since been maintained, but members may have forgotton that because of John Gillies it had a standing which perhaps only Oxford could then equal. I have often thought that any hospital where anaesthetics are given can train anaesthetists in a vocational sense, provided that its consultants are willing to teach and to keep themselves up to date, but very few institutions orientate themselves to higher educational aims and teach the future teachers. While it would be difficult to attribute all the abilities of professors to a sojourn in one department it is interesting to note that at one time six future professors of anaesthetics were in the Department. They were S.L. Vandewater, Nick Green, Alastair Gillies, J.P. Payne, Gordon McDowall and J.D. Robertson. Quite obviously the Department was a place where ambitious and able young anaesthetists came to be taught and to absorb the academic ethos.

To achieve so much in so many fields of endeavour, medicopolitical in the Association, educational in the Faculty, and scientifically and clinically in Edinburgh would seem to have required total absorption in nothing but work. In our friendship of later years it became very clear that this was far from being the case. He had a wide and very keen interest in sport and an encyclopaedic memory for its past events; he spent much time with his family and achieved a rather rare success in having three of them enter anaesthesia, all highly successfully, and he always managed to find time for even the most junior members of his staff giving encouragement and clear advice on an open-door policy.

Mr. President, ladies and gentlemen, many of you here today knew John Gillies well. Most of you will remember his wit and charm and gift of humour, his endearing humility in one so distinguished, his enduring kindness, but few of you could have been aware that he played such a tremendous part in the development of the speciality of anaesthesia and I hope that I have succeeded today in bringing you some enlightenment. He was recognised, feted and honoured in all countries and he most fittingly followed the Edinburgh tradition in anaesthesia

established by that other great Scot, Sir James Young Simpson.

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References

1. Featherstone, H.W. (1946). The Association of Anaesthetists of Great Britain and Ireland. **Anaesthesia, 1,** 5 –9.
2. Gillies, J. (1950). Anaesthetic factors in the causation and prevention of excessive bleeding during surgical operations. Ann. Roy. Coll. Surg. Engl., **7,** 204 – 221.
3. Gillies, J. (1952). Physiological Trepass in Anaesthesia, (President's address). Proc. Roy. Sco. Med., **45,** 1 – 6.
4. Griffiths, H.W.C., and Gillies, J. (1948). Thoraco-lumbar splanchinectomy and sympathectomy; anesthetic procedure. Anaesthesia, **3,** 134 – 146.